THE

BIOLOGICAL BULLETIN

PUBLISHED BY THE MARINE BIOLOGICAL LABORATORY

THE MARINE BIOLOGICAL LABORATORY

Sixty-Fourth Report, for the Year 1961—Seventy-Fourth Year

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1
MARINE BIOLOGICAL LABORATORY

F. P. KNOWLTON, Syracuse University
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W. J. V. OSTERHOUT, Rockefeller Institute
CHARLES PACKARD, Woods Hole, Massachusetts
A. C. REDFIELD, Woods Hole Oceanographic Institution
LAWRASON RIGGS, 74 Trinity Place, New York 6, N. Y.

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ERIC G. BALL, Harvard Medical School
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MAC V. EDDS, Jr., Brown University
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I. M. KLOTZ, Northwestern University
ARNOLD LAZAROW, University of Minnesota Medical School
ALFRED H. STURTEVANT, California Institute of Technology
GEORGE WALD, Harvard University

TO SERVE UNTIL 1964

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K. S. COLE, National Institutes of Health
S. KUFFLER, Harvard Medical School
C. B. METZ, Oceanographic Institute, Florida State University
ROBERTS RUGH, College of Physicians and Surgeons, Columbia University
G. T. SCOTT, Oberlin College
E. ZWILLING, Brandeis University

TO SERVE UNTIL 1963

L. G. BARTH, Columbia University
JOHN B. BUCK, National Institutes of Health
AURIN M. CHASE, Princeton University
SEYMOUR S. COHEN, University of Pennsylvania School of Medicine
DONALD P. COSTELLO, University of North Carolina
TERU HAYASHI, Columbia University
DOUGLAS A. MARSLAND, New York University, Washington Square College
H. BURR STEINBACH, University of Chicago

TO SERVE UNTIL 1962

FRANK A. BROWN, Jr., Northwestern University
SEARS CROWELL, Indiana University
ALBERT I. LANSING, University of Pittsburgh Medical School
WILLIAM D. McELROY, Johns Hopkins University
C. LADD PROSSER, University of Illinois
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MARY SEARS, Woods Hole Oceanographic Institution
ALBERT TYLER, California Institute of Technology
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John Buck, 1962
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Roger L. Greif
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Walter L. Wilson
Walter S. Vincent

The Research Space Committee

Philip B. Armstrong, Chairman
Arthur K. Parpart

Mac V. Edds, Jr.
William D. McElroy
II. ACT OF INCORPORATION

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 the 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 Friday following the second Tuesday in August in each year at the Laboratory in Woods Hole, Massachusetts, at 9:30 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
BY-LAWS OF THE CORPORATION

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 promptly after the Annual Meeting of the Corporation at the Laboratory in Woods Hole, Mass. 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. After having served two consecutive terms of four years each, Trustees are ineligible for re-election until a year has elapsed. In addition, there shall be two groups of Trustees as follows:

(B) Trustees ex officio, who shall be the President and Vice President of the Corporation, the Director of the Laboratory, the Associate Director, the Treasurer, and the Clerk:

(C) Trustees Emeriti, who shall be elected from present or former 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 Emeriti shall have all the rights of the Trustees except that Trustees Emeriti 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.

IX. The Trustees shall have the control and management of the affairs of the Corporation; they shall elect a President of the Corporation who shall also be Chairman of the Board of Trustees and who shall be elected for a term of five years and shall serve until his successor is selected and qualified; and shall also elect a Vice President of the Corporation who shall also be the Vice Chairman of the Board of Trustees and who shall be elected for a term of five years and shall serve until his successor is selected and qualified; 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. The Board of Trustees shall have the 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. They shall from time to time elect members to the Corporation upon such terms and conditions as they may think best.

X. The Associates of the Marine Biological Laboratory shall be an unincorporated group of persons (including associations and corporations) interested in the Laboratory and shall be organized and operated under the general supervision and authority of the Trustees.
XI. 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.

XII. The account of the Treasurer shall be audited annually by a certified public accountant.

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

IV. REPORT OF THE DIRECTOR

To: THE TRUSTEES OF THE MARINE BIOLOGICAL LABORATORY

Gentlemen:

I submit herewith the report of the seventy-fourth session of the Marine Biological Laboratory.

1. Plant Additions

During the past winter six cottages were built on the Devil's Lane Tract with funds which were generously granted the Laboratory by the James Foundation of New York. These are winterized cottages which can be available throughout the year to visiting scientists at the Laboratory. This significant addition to the Laboratory's housing will help to ease a difficult situation.

2. Systematics-Ecology Program

Dr. Melbourne R. Carriker has been appointed Director of the Systematics-Ecology Program, the appointment to become effective on September 1, 1962. Dr. Carriker took his Bachelor of Science degree at Rutgers in 1939 and his Doctor of Philosophy degree at the University of Wisconsin in 1943. He has been a member of the zoology staffs at Rutgers University and at the University of North Carolina and has served as Supervisory Fishery Research Biologist at the Oxford, Maryland, Biological Laboratory of the Bureau of Commercial Fisheries. The program under Dr. Carriker's direction will be financed in part by a grant from the Ford Foundation.

3. Personnel Changes

This past summer Dr. Eugene P. Odum completed his five-year term as head of the training program in Marine Ecology and is being succeeded by Dr. John H. Ryther. Dr. J. Woodland Hastings takes charge of the training program in Physiology, succeeding Dr. W. D. McElroy. Dr. C. B. Metz will head up the newly established training program in Fertility Problems and Dr. James D. Ebert will take over the direction of the Embryology training program. The Laboratory has been most fortunate in the men it has enlisted as heads of its various training programs.
4. Naming of Buildings

At its midwinter meeting the Board of Trustees named its two main laboratories in honor of two former Directors of the Laboratory. The main laboratory will be known as the Lillie Building in honor of Frank R. Lillie, Director from 1908 to 1926 and President of the Corporation from 1925 to 1942. Dr. Lillie is in a large measure responsible for the modern development of the Laboratory. The new laboratory building will be the Whitman Building in honor of Charles O. Whitman, Director from 1888 to 1908, who guided the destinies of the Laboratory through a very critical period of its development. Suitable plaques will be placed on these buildings recording this action of the Board of Trustees.

5. Grants, Contracts and Contributions in Support of Laboratory Activities, including Training Grants

The total income from these services of support amounted to $302,716 in 1961. This represents 31% of the $988,172 total income and is made up of support from the following:


6. Deaths

During the course of the year the Laboratory lost two of its very eminent members through death, Dr. Otto Loewi and Dr. G. Failla. Both of these scientists conferred distinction on the Laboratory through their membership in the Corporation and their scientific activities through many summers of research activity at the Laboratory.

Also we must note the passing of Mr. Alton J. Pierce of the technical staff who was highly regarded for his kind good nature, cooperativeness and technical skill.

Respectfully submitted,

PHILIP B. ARMSTRONG

Director

ZOOGOLOGY

I. Consultants

F. A. Brown, Jr., Professor of Zoology, Northwestern University
Libbie H. Hyman, American Museum of Natural History
Alfred C. Redfield, Woods Hole Oceanographic Institution
II. INSTRUCTORS

Clark P. Read, Professor of Biology, Rice University, in charge of the course
Bernard L. Strehler, Chief, Cellular and Comparative Physiology, Division of Gerontology, National Institutes of Health
Richard C. Sanborn, Professor of Zoology, Purdue University
James Case, Associate Professor of Zoology, State University of Iowa
Earl Segal, Assistant Professor of Biology, Rice University
Charles E. Jenner, Professor of Zoology, University of North Carolina
W. D. Russell Hunter, Department of Zoology, University of Glasgow, Scotland, U. K.

III. Assistants

David C. Grant, Yale University
Stephen Smith, Wesleyan University

EMBRYOLOGY

I. INSTRUCTORS

Nelson T. Spratt, Jr., Professor of Zoology, University of Minnesota, in charge of the course
Philip Grant, Assistant Professor of Pathobiology, The Johns Hopkins University
John W. Saunders, Jr., Professor of Zoology, Marquette University
Tore Hultin, Wenner-Grens Institute, Stockholm, Sweden
Aaron Moscona, Professor of Zoology, University of Chicago
Laurens Ruben, Assistant Professor of Biology, Reed College

II. LABORATORY ASSISTANTS

John Arnold, Oberlin College
Richard Whittaker, Yale University

PHYSIOLOGY

I. CONSULTANTS

Merkel H. Jacobs, Professor of Physiology, University of Pennsylvania
Otto Loewi, Professor of Pharmacology, New York University School of Medicine
Arthur K. Parpart, Professor of Biology, Princeton University
Albert Szent-Györgyi, Director, Institute for Muscle Research, Marine Biological Laboratory

II. INSTRUCTORS

W. D. McElroy, Director, McCollum-Pratt Institute, Johns Hopkins University; in charge of the course
Philip E. Hartman, Associate Professor of Biology, Johns Hopkins University
Timothy H. Goldsmith, Yale University
Howard K. Schachman, Virus Laboratory, University of California, Berkeley
Robert B. Loftfield, Massachusetts General Hospital
André Jacquenod, McCollum-Pratt Institute, Johns Hopkins University
J. Woodland Hastings, Assistant Professor of Biochemistry, University of Illinois
REPORT OF THE DIRECTOR

III. LABORATORY ASSISTANT

Luis Otero, University of Puerto Rico, Rio Piedras

BOTANY

I. CONSULTANT

William Randolph Taylor, Professor of Botany, University of Michigan

II. INSTRUCTORS

Richard C. Starr, Professor of Botany, Indiana University, in charge of the course
Walter R. Herndon, Associate Professor of Botany, University of Alabama
John M. Kingsbury, Associate Professor of Botany, Cornell University
Tyge Christensen, Institut for Sporeplanter, University of Copenhagen

III. LABORATORY ASSISTANTS

Austin Brooks, Department of Biology, Wabash College
Wayne Nichols, Department of Biology, University of Alabama

ECOLOGY

I. CONSULTANTS

Paul Galtsoff, U. S. Fish and Wildlife Service, Woods Hole
Alfred C. Redfield, Woods Hole Oceanographic Institution
Bostwick H. Ketchum, Woods Hole Oceanographic Institution
Edwin T. Moul, Rutgers University
Charles E. Jenner, University of North Carolina
Howard T. Odum, University of Texas

II. INSTRUCTORS

Eugene P. Odum, Alumni Foundation Professor of Zoology, University of Georgia, in
charge of the course
John H. Ryther, Marine Biologist, Woods Hole Oceanographic Institution
Howard L. Sanders, Woods Hole Oceanographic Institution
Walter R. Taylor, Chesapeake Bay Institute, Johns Hopkins University

III. LABORATORY ASSISTANTS

Elijah V. Swift, Johns Hopkins University
William S. Broughton, University of Georgia

1. THE LABORATORY STAFF

Mrs. Deborah Lawrence Harlow, Librarian
Carl O. Schweidenback, Manager, Supply Department
Irvine L. Broadbent, Office Manager

Robert Kahler, Superintendent, Buildings and Grounds
Robert B. Mills, Manager, Department of Research Service
GENERAL OFFICE

Mrs. Lila S. Myers
Mrs. Vivien R. Brown
Mrs. Virginia M. Morehouse
Mrs. Marion C. Chase
Mrs. Vivian I. Manson
Mrs. Ruth Mayo

LIBRARY

Noreen Richmond
Doris Ricker
Teena B. Chase
Albert K. Neal

MAINTENANCE OF BUILDINGS AND GROUNDS

Robert Adams
Elizabeath Kuil
Eldon P. Allen
Donald B. Lehy
Francis Cavanaugh
Ralph H. Lewis
Manuel P. Dutra
Russell F. Lewis
Stanley Eldredge
Alan G. Lunn
Gardner F. Gayton
Ellen T. Nickelson
Robert Gunning
James S. Thayer
Walter J. Jaskun
Robert H. Walker, Jr.

DEPARTMENT OF RESEARCH SERVICE

Gail M. Cavanaugh
Lowell V. Martin
Caroline McDaniel
Frank E. Sylvia
Seaver R. Harlow

SUPPLY DEPARTMENT

Donald P. Burnham
Bruno F. Trapasso
Arnold Bowden
John J. Valois
Robert O. Lehy
Jared L. Vincent
Robert M. Perry
Hallett S. Wagstaff
Mrs. Patricia Tavares

2. Investigators; Lalor and Lillie Fellows; and Students

Independent Investigators, 1961

Adams, Ralph G., Physicist, National Institutes of Health
Adelberg, Edward A., Professor of Bacteriology, University of California
Adelman, William J., Jr., Physiologist, National Institutes of Health
Aljure, Emilio, Universidad del Valle, Cali, Colombia
Allen, M. Jean, Professor of Biology, Wilson College
Armstrong, Philip B., Professor of Anatomy, State University of New York College of Medicine, at Syracuse
Atwood, Kimball C., Professor of Microbiology, University of Illinois
Austin, C. R., Member of Research Staff, National Institute for Medical Research, London
Baird, Spencer L., Associate, Institute for Muscle Research
Barth, L. G., Professor of Zoology, Columbia University
Baylor, Martha B., Marine Biological Laboratory
Bennett, Michael V. L., Assistant Professor of Neurology, College of Physicians and Surgeons
Bernstein, Maurice H., Assistant Professor of Anatomy, Wayne State University
Beukers, Robert, Staff Member, Technological University, Delft, Netherlands
BINTOCK, LEONARD, Electronic Engineer, National Institutes of Health
BLAKE, JOHN M., Chief Biologist, Aquacultural Research Corporation
BLUM, JOHN L., Professor of Biology, Canisius College
BOSLER, ROBERT, Dept. of Pharmacology, Harvard Medical School
BROWN, FRANK A., Jr., Morrison Professor of Biology, Northwestern University
BRYANT, S. H., Assistant Professor of Pharmacology, University of Cincinnati, College of Medicine
BURKE, JOSEPH A., Assistant Professor of Biology, Loyola College
CAMPBELL, JAMES W., Instructor in Biology, Rice University
CARLSON, FRANCIS D., Professor of Biophysics, Johns Hopkins University
CASE, JAMES, Associate Professor of Zoology, University of Iowa
CHAET, ALFRED B., Associate Professor of Biology, American University
CHANDLER, WILLIAM K., Medical Officer, National Institutes of Health
CHENEY, RALPH HOLT, Professor of Biology, Brooklyn College
CHILD, FRANK M., Assistant Professor of Zoology, University of Chicago
CHRISTENSEN, A. KENT, Instructor in Anatomy, Harvard Medical School
CHRISTENSEN, TYGE, University of Copenhagen, Institute of Thalllophyta
CLAPP, C. LLOYD, Research Associate in Surgery, Harvard Medical School
CLARK, ARNOLD M., Professor of Biological Sciences, University of Delaware
COLE, KENNETH S., Chief, Laboratory of Biophysics, National Institutes of Health
COLLIER, JACK R., Marine Biological Laboratory
COLWIN, ARTHUR L., Professor of Biology, Queens College
COLWIN, LAURA HUNTER, Queens College
COOPERSTEIN, SHERWIN J., Associate Professor of Anatomy, Western Reserve University
COPELAND, EUGENE, Professor of Zoology, Tulane University
COSTELLO, DONALD PAUL, Kenan Professor of Zoology, University of North Carolina
CRANE, ROBERT K., Associate Professor of Biological Chemistry, Washington University Medical School
CROWELL, SEARS, Associate Professor of Zoology, Indiana University
CSAPO, ARPAD L., Associate Professor, Rockefeller Institute
DALTON, JOHN C., Assistant Professor of Biology, University of Buffalo
DETTBARN, WOLF-DIETRICH, Assistant Professor of Neurology, College of Physicians and Surgeons
DIAMOND, JACK, Harvard Medical School
EDDS, MAC V., JR., Professor of Biology, Brown University
FAILLA, G., Senior Physicist Emeritus, Argonne National Laboratory
FERGUSON, JAMES J., JR., Assistant Professor, University of Pennsylvania
FISCHER, SIGMUND, Associate in Research, Albert Einstein College of Medicine
FITZPATRICK, THOMAS B., Professor of Dermatology, Massachusetts General Hospital
FRAZIER, HOWARD S., Massachusetts General Hospital
FUSHPAN, EDWIN J., Associate in Neurophysiology, Harvard Medical School
GAINER, HAROLD, Research Associate, College of Physicians and Surgeons
GILMAN, LAUREN C., Associate Professor of Zoology, University of Miami
GIRARDIER, LUCIEN, Research Associate, College of Physicians and Surgeons
GLADE, RICHARD W., Assistant Professor of Zoology, University of Vermont
GOLDRING, IRENE F., Assistant Professor of Research Surgery, Albert Einstein College of Medicine
GOLDSMITH, TIMOTHY H., Yale University
GRANT, PHILIP, Assistant Professor of Pathobiology, Johns Hopkins University School of Hygiene
GREER, ROGER L., Associate Professor of Physiology, Cornell University Medical College
GROSCH, DANIEL S., Professor of Genetics, North Carolina State College
GROSS, PAUL R., Associate Professor of Biology, New York University
GRUNDFEST, HARRY, Professor of Neurology, College of Physicians and Surgeons
GUTTMAN, RITA, Associate Professor of Biology, Brooklyn College
GWILLIAM, GILBERT F., Assistant Professor of Biology, Reed College
HAGINS, WILLIAM A., Physiologist, National Institutes of Health
HAGIWARA, SUSUMU, Professor of Zoology, University of California
MARTINEZ, CLIFFORD V., Assistant Professor of Physiology, College of Physicians and Surgeons
HARTMAN, PHILIP E., Associate Professor of Biology, Johns Hopkins University
HARVEY, ETHEL BROWN, Marine Biological Laboratory
HASTINGS, J. WOODLAND, Assistant Professor of Biochemistry, University of Illinois
HATHAWAY, RALPH R., Oceanographic Institute, Florida State University
HAYASHI, TERU, Professor of Zoology, Columbia University
HIGLEY, ANDREW, Institute for Muscle Research, Marine Biological Laboratory
HENLEY, CATHARINE, Research Associate, University of North Carolina
HERNANDO, WALTER R., Associate Professor of Biology, University of Alabama
HERVEY, JOHN P., Senior Electronic Engineer, Rockefeller Institute
HERZOG, WALTER, Post Doctoral Fellow in Pharmacology, University of Cincinnati College of Medicine
HIGMAN, HENRY B., College of Physicians and Surgeons
HISKIN, FRANCIS C. G., Assistant Professor of Neurology, College of Physicians and Surgeons
HULTIN, TORE, Wenner-Grens Institute, University of Stockholm
HUNTER, W. D. RUSSELL, Lecturer in Zoology, University of Glasgow, Scotland
HURWITZ, JERARD, Associate Professor of Microbiology, New York University School of Medicine
ISENBERG, IRVIN, Institute for Muscle Research, Marine Biological Laboratory
JAGENDORF, ANDRE, Associate Professor, Johns Hopkins University
JANISZEWSKI, LESZEK, Master of Biology, N. Copernicus University, Poland
JENNER, CHARLES E., Professor of Zoology, University of North Carolina
KAMINER, BENJAMIN, Institute for Muscle Research, Marine Biological Laboratory
KANE, ROBERT E., Assistant Professor of Cytology, Dartmouth Medical School
KATZ, GEORGE M., Research Associate, Columbia University
KEMPSON, RUDOLF T., Professor of Zoology, Vassar College
KIRKIAN, JOHN, Professor of Biology, Rutgers, The State University
KINGSBURY, JOHN M., Associate Professor of Botany, Cornell University
KISHimoto, UICHiro, National Institutes of Health
KLEINHOLZ, LEWIS H., Professor of Biology, Reed College
KRAUSS, STEPHEN M., Associate in Medicine, Harvard Medical School
KUFFLER, STEPHEN W., Professor of Neurophysiology, Harvard Medical School
LANDAU, JOSEPH V., Chief, Oncology Section, VA Hospital, Albany, New York
LANSING, ALBERT I., Professor of Anatomy, University of Pittsburgh School of Medicine
LAZAROW, ARNOLD, Professor of Anatomy, University of Minnesota
LEAF, ALEXANDER, Associate Professor of Medicine, Harvard Medical School
LEIFMAN, SIDNEY, Assistant Professor of Ophthalmology, University of Rochester
LEVY, MILTON, Professor of Biochemistry, New York University College of Dentistry
LOCKHEAD, JOHN H., Professor of Zoology, University of Vermont
LOwenstein, Werner R., Associate Professor of Physiology, College of Physicians and Surgeons
LOFTFIELD, ROBERT B., Associate Biochemist, Massachusetts General Hospital
LONDON, IRVING M., Professor of Medicine, Albert Einstein College of Medicine
LORAND, L., Associate Professor of Chemistry, Northwestern University
LORENZO, A. J., Director Anatomical and Pathological Laboratories, Johns Hopkins University
LOVE, WARNER E., Assistant Professor of Biophysics, Johns Hopkins University
MAHLER, H. R., Professor of Chemistry, Indiana University
MARSLAND, DOUGLAS, Professor of Biology, Washington Square College
MATEYKO, G. M., Assistant Professor of Biology, Washington Square College
McELROY, WILLIAM D., Director, McCollum-Pratt Institute, Johns Hopkins University
METZ, CHARLES B., Professor of Zoology, Florida State University
METZ, CHARLES W., Emeritus Professor of Zoology, University of Pennsylvania
MIDDLEBROOK, WILLIAM R., Institute for Muscle Research, Marine Biological Laboratory
MILKMAN, ROGER D., Associate Professor of Zoology, Syracuse University
MILLER, FAITH S., Assistant Professor of Anatomy, Tulane University
Miller, JAMES A., Professor of Anatomy, Tulane University
REPORT OF THE DIRECTOR

MOORE, RICHARD O., Professor, Ohio State University
MORRILL, JOHN B., Assistant Professor, Wesleyan University
MOSCOWA, A. A., Professor of Zoology, University of Chicago
MULLINS, LORIN J., Professor of Biophysics, University of Maryland
MUSACCHIA, X. J., Associate Professor of Biology, Saint Louis University
NACE, PAUL FOLEY, Professor of Biology, McMaster University
NAGI, TOSHIO, Research Associate, University of Illinois
NELSON, LEONARD, Associate Professor of Physiology, Emory University
ODUM, EUGENE P., Professor of Zoology, University of Georgia
PALINCsek, EDWARD E., Assistant Professor of Biology, Loyola University
PARKER, JOHNSON, Assistant Professor of Plant Physiology, Yale University
PARRPART, ARTHUR K., Professor of Biology, Princeton University
PENMAN, SHELDON, Assistant Professor of Physics, College of Physicians and Surgeons
PERSON, PHILIP, Chief, VA Hospital, Brooklyn
PETRIE, ASENATH, Research Associate, Harvard University and London University
POTTER, DAVID, Associate in Neurophysiology, Harvard Medical School
PROSSER, C. LAD, Professor of Physiology, University of Illinois
RAPPORT, MAURICE M., Professor of Biochemistry, Albert Einstein College of Medicine
READ, CLARK P., Professor of Biology, Rice University
REBHUN, LIONEL L., Assistant Professor of Biology, Princeton University
REUBEN, JOHN P., Research Associate, College of Physicians and Surgeons
RIESER, PETER, Head, Department of Biology, St. John Fisher College
ROCKSTEIN, MORRIS, Associate Professor of Physiology, New York University College of Medicine
ROSE, S. MERYL, Professor of Biology, Wesleyan University
ROSENBERG, EVELYN K., Associate Professor, New York University
ROSENBERG, PHILIP, Columbia University, College of Physicians and Surgeons
ROTHSTEIN, HOWARD, College of Physicians and Surgeons
ROWLAND, LEWIS P., Assistant Professor of Neurology, College of Physicians and Surgeons
RUBEN, LAURENS, Assistant Professor of Biology, Reed College
RUCK, PHILIP R., Assistant Professor of Biology, Tufts University
RUGH, ROBERTS, Associate Professor of Radiology, College of Physicians and Surgeons
RUSTAD, RONALD C., Assistant Professor of Physiology, Florida State University
SANBORN, RICHARD C., Professor of Zoology, Purdue University
SANDERS, HOWARD L., Woods Hole Oceanographic Institution
SAUNDERS, JOHN W., Professor of Biology, Marquette University
SCHACHMAN, HOWARD K., Professor of Biochemistry, University of California
SCHARRER, ERNST, Professor of Anatomy, Albert Einstein College of Medicine
SCHOFFENIELS, ERNEST, Assistant Professor of Neurology, College of Physicians and Surgeons
SCOTT, ALLAN, Professor of Biology, Colby College
SCOTT, SISTER FLORENCE MARIE, Professor of Biology, Seton Hill College
SCOTT, GEORGE T., Chairman, Department of Biology, Oberlin College
SEGAL, EARL, Assistant Professor of Biology, Rice University
SELIGER, HOWARD H., Research Associate, McCollum-Pratt Institute, Johns Hopkins University
SHER, ALFRED W., Marine Biological Laboratory
SENGEL, PHLIPPE, Collège de France
SIMMONS, JOHN E., Rice University
SJÖHÖN, RAYMOND A., Associate Professor of Biophysics, University of Maryland
SLIFER, ELEANOR H., Professor of Zoology, State University of Iowa
SMELSER, GEORGE K., Professor of Anatomy, Columbia University
SONNENBRICK, BENJAMIN, Professor of Biology, Rutgers, The State University
SPECTOR, ABRAHAM, Instructor, Howe Laboratory, Harvard Medical School
SPREDEL, CARL C., Professor of Anatomy, University of Virginia
SPINDEl, WILLIAM, Associate Professor of Chemistry, Rutgers University
SPRATt, NELSON T., Chairman, Department of Zoology, University of Minnesota
SPYROPOLUOS, CONSTANTINE S., Neurophysiologist, National Institutes of Health
STARR, RICHARD C., Professor of Botany, Indiana University
STEFFENSEN, DALE M., Associate Professor of Botany, University of Illinois
STEINBACH, H. BURR, Professor of Zoology, University of Chicago
STEINER, JACINTO, Director, Operations Evaluation Group, Massachusetts Institute of Technology
STETTEN, DEWITT, Jr., Associate Director, NIAMD, National Institutes of Health
STONE, WILLIAM, Jr., Director, Ophthalmic Plastics Laboratory
STREHLER, BERNARD L., Chief, Cellular and Comparative Physiology Section, National Institutes of Health
STRITTMATTER, PHILIPP, Assistant Professor of Biochemistry, Washington University
SUSSMAN, MAURICE, Professor of Biology, Brandeis University
SZABO, GEORGE, Associate in Anatomy, Harvard Medical School
SZENT-GYORGYI, ALBERT, Director, Institute for Muscle Research, Marine Biological Laboratory
SZENT-GYORGYI, ANDREW, Head of Muscle Section, Institute for Muscle Research, Marine Biological Laboratory
TASAKI, ICHIJI, Chief, Special Senses Section, National Institutes of Health
TAYLOR, ROBERT E., Physiologist, National Institutes of Health
TAYLOR, WILLIAM RANDOLPH, Professor of Botany, University of Michigan
TAYLOR, W. ROWLAND, Assistant Professor of Oceanography, Johns Hopkins University
TEORELL, TORSTEN, Professor, University of Upsala
DE TERRA, NOEL, Research Associate, Rockefeller Institute
TORCH, REUBEN, Associate Professor of Zoology, University of Vermont
TREMS, EBERHARD G., National Institutes of Health
TRAVIS, DAVID MONROE, Assistant Professor of Pharmacology, University of Florida
TROLL, WALTER, Associate Professor, New York University Medical Center
TUNIK, BERNARD D., Associate Professor, State University of New York, Long Island
TWEDDELL, KENYON S., Assistant Professor of Biology, University of Notre Dame
DE VILLA FRANCA, GEORGE W., Associate Professor of Zoology, Smith College
VILLER, CLAUDE A., Associate Professor of Biological Chemistry, Harvard University
VINCENT, WALTER S., Assistant Professor of Anatomy, Upstate Medical Center, State University of New York
WALD, GEORGE, Professor of Biology, Harvard University
WARREN, LEONARD, National Institutes of Health
WEBB, H. MARCUGNETE, Associate Professor of Biological Sciences, Goucher College
WHITTING, ANNA R., University of Pennsylvania
WICHERMAN, RALPH, Professor of Biology, Temple University
WIECINSKI, FLOYD J., Associate Professor of Biological Sciences, Drexel Institute of Technology
WILBER, CHARLES G., Dean of the Graduate School, Kent State University
WILSON, WALTER L., Associate Professor of Physiology, University of Vermont
WITTENBERG, JONATHAN B., Associate Professor of Physiology, Albert Einstein College of Medicine
WOLFF, ETIENNE, Professor au Collège de France
WOLFSKY, ALEXANDER, Professor of Experimental Embryology, Fordham University
WRIGHT, PAUL A., Associate Professor of Zoology, University of New Hampshire
WURTZ, ROBERT, University of Michigan
WYTTENBACH, CHARLES R., Instructor in Anatomy, University of Chicago
ZIGMAN, SEYMOUR, Research Associate, Ophthalmic Plastics Laboratory
ZIMMERMAN, ARTHUR M., Assistant Professor, State University of New York, Downstate Medical Center
ZWILLING, EDGAR, Professor of Biology, Brandeis University

Lalor Fellows, 1961

WOLFF, ETIENNE, Collège de France
CHRISTENSEN, A. KENT, Harvard Medical School
HATHAWAY, RALPH, Florida State University
SENGEL, PHILIPPE, Collège de France
SENGEL, M. LOUISE, Collège de France
WARREN, LEONARD, National Institutes of Health
REPORT OF THE DIRECTOR

Lillie Fellow, 1961

AUSTIN, C. R., National Institute for Medical Research, London

Grass Fellows, 1961

GRAFSTEIN, Bernice, McGill University
HALL, Zach, Emory University
HERZOG, Walter, University of Cincinnati College of Medicine
WURTZ, Robert, University of Michigan

Beginning Investigators, 1961

ADVE, James C., Johns Hopkins University
BAUER, G. Eric, University of Minnesota
BEAMES, Calvin G., Jr., Rice University
BITO, Laszlo, Columbia University
BRINLEY, F. J., Jr., Johns Hopkins Medical School
BROWN, Joel E., Massachusetts Institute of Technology
CHERVIN, Paul N., University of Vermont
CHRISTANSEN, Janice H., Temple University School of Medicine
DOOLITTLE, Russell F., Harvard University Medical School
DUNHAM, Philip B., University of Chicago
ECKERT, Roger O., Harvard University
EISENBERG, Robert S., Harvard College
FIELD, James B., National Institutes of Health
FOX, Stephen S., University of Michigan
GASSLING, Mary T., Marquette University
HUMPHREYS, Tom Daniel, University of Chicago
ISHIKO, Nobusada, Kumamoto University Medical School
JACKSON, James A., Western Reserve University
KITAZUME, Yosuji, University of Kobe, Japan
LEIBERMAN, Paul M., University of Vermont
MOORE, Richard O., Ohio State University
MORAN, Joseph F., Russell Sage College
SCHLESINGER, Robert M., National Institutes of Health
SCHUEL, Herbert, Florida State University
SHEPHERD, David C., University of Chicago
SLAYMAN, Clifford L., Rockefeller Institute
SRINIVASAN, Dobl, Columbia University
STONE, Audrey L., National Institutes of Health
WHEELER, Maynard B., Columbia University

Research Assistants, 1961

ALEXANDER, Douglas Gordon, University of North Carolina
ALLAWAY, Elizabeth, Mount Holyoke College
ARNOLD, John M., Oberlin College
ATLAS, Meryl, State University of New York, Upstate Medical Center
BARNWELL, Franklin H., Northwestern University
BART, Kenneth, State University of New York, Upstate Medical Center
BENNETT, John E., Purdue University
Benzinger, Rolf H., Johns Hopkins University
BOLKVIN, Brenda J., Harvard Medical School
BOOKER, Virginia Too, Smith College
BOWERS, William E., College of Physicians and Surgeons
BRADBURY, Jack W., Reed College
BREWER, John M., Johns Hopkins University
BROOKS, Austin, Wabash College
BROUGHTON, William S., University of Georgia
BYRNE, Sylvia A., Syracuse University
CARLIN, Ira S., Plymouth, Mass.
CECCARINI, Costante, St. Peter's College
CICAK, Anna, Albert Einstein College of Medicine
CLARK, Eloise E., Columbia University
COHN, Dunell E., Oak Ridge, Tennessee
CORAB, Mary, Brooklyn, New York
CORNELL, Kenneth, Institute for Muscle Research, Marine Biological Laboratory
Cox, Eleanor, University of Texas
CROSBY, Gayle M., Brandeis University
CROWE, Priscilla Ann, Seton Hill College
DE LA CRUZ, Armando, University of the Philippines
DEMUTH, Simon H., College of Physicians and Surgeons
DEWEL, William C., Wesleyan University
DOUGHERTY, William J., Princeton University
EDWARDS, Jackie, University of Alabama
EIGER, Elizabeth Ann, Massachusetts General Hospital
EMMONS, Louise H., North Carolina State College
ERKING, Mrs. Louise, Institute for Muscle Research, Marine Biological Laboratory
EVANS, Thomas Edward, Florida State University
FEIBEL, Robert Marks, University of Cincinnati Medical College
FISHER, Sylvia Sue, Saint Louis University
FLATHERS, Ann R., University of New Hampshire
FORAN, Elizabeth, Smith College
FRANCESCO, Anne S., Agnes Scott College
FRIEDMAN, Sue, Smith College
VAN GELDER, Nico M., Harvard Medical School
GINNEN, Allen, Brooklyn Veterans Administration Hospital
GINSBERG, Myron D., Wesleyan University
GRABESKE, Robert Jerold, University of Kansas
GRANT, David C., Yale University
GRANT, Robert J., Columbia University
GRIGGS, Robert C., University of Delaware
GRIMES, Marian, Western Reserve University
GURRY, Susan M., Smith College
GUTKNECHT, John, University of North Carolina
HABAS, Linda B., University of Illinois
HALL, Prudence J., Princeton University
HARDY, Donna Joy, Johns Hopkins University
HAYWARD, George Edward, Washington University
HECK, Henry D'Arcy, Princeton University
HINSHAW, Carolyn Jo, Indiana University
HIRSCH, Regina, New York State University, Downstate Medical Center
HUFNAGEL, Linda A., University of Vermont
JACKSON, Thomas John, Jefferson Medical College
KARSTADT, Myron, Queens College
KAYSER, Eleonore, McCollum-Pratt Institute, Johns Hopkins University
KENT, Barbara, New York City
KIELICH, J. C., Massachusetts Eye and Ear Infirmary
KIMBALL, Frances, Reed College
KITZMAN, William B., Rice University
KUSANO, Kiyoshi, Tokyo Medical-Dental University
LAMBOR, Marvin R., Hunting Laboratories, Massachusetts General Hospital
LANG, Norma J., Indiana University
LAUFENBERG, Henry J., Jr., Hahnemann Medical College
LEE, Thomas W., Rice University
Library Readers, 1961

Adams, Elijah, Professor of Pharmacology, Saint Louis University School of Medicine
Ball, Eric G., Professor of Biological Chemistry, Harvard Medical School
Bodansky, Oscar, Chief, Sloan-Kettering Institute for Cancer Research
Buck, John, Physiologist, National Institutes of Health
Burkanc, W. D., Professor of Biology, Emory University
Butler, Elmer G., Osborn Professor of Biology, Princeton University
Chase, Aurin M., Associate Professor of Biology, Princeton University
Clement, A. C., Professor of Biology, Emory University
Clifford, Sister Adele, Professor of Biology, College of Mount St. Joseph
Cohen, Seymour S., Professor of Biochemistry, University of Pennsylvania
Davis, Bernard D., Professor of Bacteriology, Harvard Medical School
Eisen, Herman N., Professor of Microbiology, Washington University
Flesch, Peter, Associate Professor of Research Dermatology, University of Pennsylvania
Fries, E. F. B., Professor, City College of New York
Gabriel, Mordecai L., Associate Professor of Biology, Brooklyn College
Ginsberg, Harold S., Chairman, Department of Microbiology, University of Pennsylvania
Gurwisch, Vladimir, Associate Physician, Cornell Division, Bellevue Hospital
Hoberman, Henry D., Professor of Biochemistry, Albert Einstein College of Medicine
Hitchin, John E., Assistant Director, New York State Department of Health
Hurwitz, Charles, VA Hospital, Albany
Isselbacher, Kurt J., Assistant Professor of Medicine, Harvard Medical School
Jacobs, M. H., Emeritus Professor of General Physiology, University of Pennsylvania
Kabot, Elvin A., Professor of Microbiology, College of Physicians and Surgeons
Karush, Fred, Professor of Microbiology, University of Pennsylvania School of Medicine
Klein, Morton, Professor of Microbiology, Temple University
Klotz, Irving M., Professor of Chemistry, Northwestern University
Knobl, Ernst, Assistant Professor of Physiology, Harvard University
Levine, Rachmiel, Professor of Medicine, New York Medical College
Lineaweaver, Thomas H., Woods Hole, Massachusetts
Lowenstein, Irene E., Research Assistant in Ophthalmology, College of Physicians and Surgeons
Lowenstein, Otto, Research Associate in Ophthalmology, College of Physicians and Surgeons
Malkiel, Saul, Research Associate, Harvard Medical School
McDonald, Sister Elizabeth Seton, Professor of Biology, College of Mt. St. Joseph
McIntyre, F. C., Head of Biochemical Research, Abbott Laboratories
Novikoff, Alex B., Research Professor, Albert Einstein College of Medicine
Pullman, Bernard, Institut de Biologie Physico-Chimique, Paris
Reeves, Robert Blake, Assistant Professor of Zoology, Cornell University
Roth, Jay S., Professor of Biochemistry, University of Connecticut
Sandeen, Muriel I., Assistant Professor of Zoology, Duke University
Schlamowitz, Max, Associate Cancer Research Scientist, Roswell Park Memorial Institute
Spiegel, Melvin, Assistant Professor of Zoology, Dartmouth College
Uretz, Robert B., Assistant Professor of Biophysics, University of Chicago
Wainio, Walter W., Professor of Biochemistry, Rutgers, The State University
Wheeler, George E., Assistant Professor of Biology, Brooklyn College
Wilson, Irwin B., Associate Professor of Biochemistry, College of Physicians and Surgeons
Yntema, Chester L., Professor of Anatomy, State University of New York, Upstate Medical Center
Zorzoli, Anita, Associate Professor of Physiology, Vassar College
REPORT OF THE DIRECTOR

Students, 1961

All students listed completed formal course program, June 19 to July 29th. Asterisk indicates students completing Post Course Research Program, July 30 to September 2nd.

ECOLOGY

*Mary A. Ashcraft, Wilson College
*Robert J. Barsdate, University of Pittsburgh
Carol A. Baumann, Chatham College
*L. Lehr Brisbin, Wesleyan University
Charles H. Butterfield, Chevy Chase, Maryland
David A. Dobins, University of Minnesota
*Roger W. Doyle, Dalhousie University
*Dirk Frankenber, Emory University
*Thomas A. Gaucher, Narragansett Marine Laboratory
John Gutknecht, University of North Carolina
*William T. Hall, Fordham University
George Hayward, Washington University
Conrad A. Istock, University of Michigan
Marvin P. Kael, University of Georgia
*Walter E. Knox, Drew University
Barbara March, Marquette University
*Elba L. Mas, Yale University
*Fermin Sagardia, Rutgers University
*Judith A. Shulman, Cornell University
*Sandra Elizabeth Wagner, Vassar College
*Margaret J. Waldrep, University of Alabama
Robert G. Wetzel, University of California

BOTANY

Marilyn L. Albert, University of Texas
George C. Carroll, Swarthmore College
*Charles F. Cleland, Wabash College
Eleanor Cox, University of Texas
*William H. Darden, Jr., University of Alabama
Victor Emanuel, University of Texas
*Robert B. Gordon, University of California
*Dana G. Griffin, III, Texas Technological College
*R. Don Groover, University of Alabama
*Jean Hatch, Vassar College
Raymond W. Holton, University of Michigan
Robert Hoshaw, University of Arizona
*Patricia Manco, Clark University
Robert McClary, Indiana University
John C. Messenger, Yale University
*William R. Rayburn, Washington University
Alvin Reeves, II, Indiana University
*Michael J. Wynne, Washington University
*Joanne R. Ziegler, Cornell University

PHYSIOLOGY

*Eric R. Bischoff, Washington University
Richard C. Blincoff, Rockefeller Institute
Lain Bowman, National Institutes of Health
*John W. Brewer, Johns Hopkins University
EMBRYOLOGY

ALLAN L. ALLENSPACH, Iowa State University
ALVIN J. CLARK, Columbia University
REV. RICHARD T. CLEARY, Johns Hopkins University
*SILAS D. EZZELL, JR., Bryn Mawr College
*PAUL E. FELL, Stanford University
ELLEN FISHER, Mt. Holyoke College
*LINDA GARRICK, Goucher College
HENRY B. GARRISON, Yale University
LUIGI GIACOMETTI, Brown University
DONALD S. GORMAN, Harvard University
*BERNICE GRAFSTEIN, McGill University
*JEROME GROSS, Massachusetts General Hospital
*JOHN L. KELLAND, Princeton University
JANOS LANYI, Harvard University
HARRIS I. LEHRER, Brandeis University
MICHAEL H. MEIDRAUGH, University of Minnesota
*FERNANDO L. REMAUD-RENAUD, University of Chicago
*GRETCHEN SCHWARTACH, Carnegie Institution of Washington
*ROBERT L. SEARLS, Brandeis University
*SIDNEY B. SIMPSON, JR., Tulane University
*RICHARD G. SKALKO, University of Florida

INVERTEBRATE ZOOLOGY

EVELYN ALPERIS, University of Massachusetts
*PETER B. ARMSTRONG, University of Rochester
*ROLAND H. BAGY, University of Illinois
RUTH R. BENNETT, Tufts College
SHIRLEY BRODY, University of Rochester
*ALBER H. CAS, JR., Dartmouth College
REPORT OF THE DIRECTOR

3. Fellowships and Scholarships, 1961

Lucretia Crocker Scholarship:
   ELEANOR COX, Botany Course
   ROBERT G. WETZEL, Ecology Course

The Merkel H. Jacobs Scholarship:
   EDWIN F. HUMPAL, JR., Physiology Course
   WILLIAM MITCHELL, Physiology Course

The Edwin Grant Conklin Memorial Scholarship:
   SIDNEY B. SIMPSON, JR., Embryology Course

The Emma Coote Drew Memorial Scholarship:
   TOM MURPHY, Physiology Course


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<td>Investigators—Total</td>
<td>326</td>
<td>410</td>
<td>427</td>
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<td>Independent</td>
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<td>203</td>
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<td>Under Instruction</td>
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<td>39</td>
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<td>Library Readers</td>
<td>42</td>
<td>54</td>
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<td>Research Assistants</td>
<td>75</td>
<td>114</td>
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### Students—Total

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<td>Embryology</td>
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<td>Physiology</td>
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<td>Botany</td>
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<td>Ecology</td>
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<td><strong>Total Attendance</strong></td>
<td>465</td>
<td>548</td>
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Less persons represented as both investigator and student: 3

### Institutions Represented—Total

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<th>129</th>
<th>142</th>
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<td>By investigators</td>
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<td>110</td>
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<tr>
<td>By students</td>
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### Schools and Academies Represented

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<tr>
<td>By students</td>
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<td>12</td>
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### Foreign Institutions Represented

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<tbody>
<tr>
<td>By investigators</td>
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<td>26</td>
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<tr>
<td>By students</td>
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</table>

Less persons represented as both investigator and student: 4

### Institutions Represented, 1961

- University of Alabama
- Albert Einstein College of Medicine
- American University
- Argonne National Laboratory
- Arizona University
- Brandeis University
- Brooklyn College
- Brown University
- University of Buffalo
- University of California
- Canisius College
- Carnegie Institution of Washington
- Chatham College
- University of Chicago
- University of Cincinnati
- City College of New York
- Clark University
- Colby College
- College of Physicians and Surgeons
- Columbia University
- University of Connecticut
- Cornell University
- Cornell University Medical School
- Dartmouth College
- Dartmouth Medical School
- University of Delaware
- DePaul University
- Drew University
- Drexel Institute of Technology
- Duke University
- D'Youville College
- Earlham College
- Emory University
- University of Florida
- Florida State University
- Fordham University
- University of Georgia
- Goucher College
- Hahmemann Medical School
- Harvard University
- Harvard University Medical School
- Howard University
- University of Illinois
- Indiana University
- Institute for Muscle Research
- Iowa University
- Iowa State University
- Jackson College
- Jefferson Medical College
- Johns Hopkins University
- University of Kansas
- Kent State University
- Lafayette College
- Loyola College
- Marquette University
- University of Maryand
- University of Massachusetts
- Massachusetts Eye and Ear Infirmary
- Massachusetts General Hospital
- Massachusetts Institute of Technology
- Medical College of Virginia
- University of Miami
- University of Michigan
- University of Minnesota
- University of Missouri
- Mount Holyoke College
- Mt. St. Joseph on the Ohio
- Muskingum College
REPORT OF THE DIRECTOR

<table>
<thead>
<tr>
<th>University of New Hampshire</th>
<th>Rutgers University</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York State University, College of Medicine at Syracuse</td>
<td>St. John Fisher College</td>
</tr>
<tr>
<td>New York State University, College of Medicine at Brooklyn</td>
<td>St. Louis University</td>
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<td>New York University</td>
<td>St. Peter's College</td>
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<td>New York University, Bellevue Medical Center</td>
<td>Seton Hill College</td>
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<td>New York University School of Dentistry</td>
<td>Single Cell Research Foundation</td>
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<td>New York University, Washington Square College</td>
<td>Sloan-Kettering Institute</td>
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<tr>
<td>New York State Department of Health</td>
<td>Smith College</td>
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<tr>
<td>North Carolina State College</td>
<td>Stanford University</td>
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<td>University of North Carolina</td>
<td>Swarthmore College</td>
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<td>Syracuse University</td>
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<td>Notre Dame University</td>
<td>Temple University</td>
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<td>Oberlin College</td>
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<td>Tufts University</td>
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<td>University of Oklahoma</td>
<td>Tulane University</td>
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<td>University of Pennsylvania</td>
<td>U. S. Fish and Wildlife Service</td>
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<td>Pennsylvania University Medical School</td>
<td>U. S. Public Health Service</td>
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<tr>
<td>University of Pittsburgh Medical School</td>
<td>Vassar College</td>
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<tr>
<td>Princeton University</td>
<td>Veterans Administration Hospital at Albany</td>
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<tr>
<td>Purdue University</td>
<td>Veterans Administration Hospital at Brooklyn</td>
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<tr>
<td>Queens College</td>
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<td>Radcliffe College</td>
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<td>Reed College</td>
<td>Wabash College</td>
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<tr>
<td>University of Rhode Island</td>
<td>Washington University</td>
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<td>Rice University</td>
<td>Washington University Medical School</td>
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<tr>
<td>University of Rochester</td>
<td>Washington and Jefferson College</td>
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<tr>
<td>Rockefeller Institute</td>
<td>Wayne State University</td>
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<td>Roswell Park Memorial Institute</td>
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<td>Russell Sage College</td>
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<td>Woods Hole Oceanographic Institution</td>
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<td>Yale University</td>
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**FOREIGN INSTITUTIONS REPRESENTED**

<table>
<thead>
<tr>
<th>University of Puerto Rico</th>
<th>University of Glasgow</th>
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<tbody>
<tr>
<td>Dalhousie University, Canada</td>
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<td>Tokyo Medical and Dental University</td>
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<td>University of Uppsala, Sweden</td>
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<td>Josephine B. Crane Foundation</td>
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<td>Swope Gift Corporation</td>
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</table>
6. FRIDAY EVENING LECTURES, 1961

June 30
C. R. Austin ......................... "Variety in mammalian egg nuclei"

July 7
Daniel E. KosHLAND .................. "Protein structure and enzyme specificity"

July 14
J. Z. Young .......................... "The visual and statocyst systems of cephalopods"

July 21
J. Z. Young .......................... "The learning systems of Octopus"

July 28
Benjamin Zweifach .................... "Reticulo-endothelial system in relation to adaptive reactions"

August 4
David H. Hubel ........................ "The eyes, the brain and perception"

August 11
Etienne Wolff ........................ "Some aspects of the principle of competition in the developing limb of the chick embryo"

August 18
Edwin Chargaff ........................ "Sequence problems in the deoxyribonucleic acids"

August 25
William P. Jacobs ........................ "Compensatory growth, cell differentiation and flowering as analyzed with the aid of formal rules of proof"

7. TUESDAY EVENING SEMINARS, 1961

July 11
Roger Milkman
Lionel I. RebHun
Donald P. Costello

"Temperature adaptation in Drosophila pupae"
"Endoplasmic reticulum in aster formation"
"The orientation of centrioles in dividing cells and its significance"

July 18
Russell Doolittle
R. H. Cheney
C. C. Speidel

"The nature of lamprey eel fibrinopeptide material"
"Equivalent dosage effects of ultraviolet and x-ray irradiation of Arbacia gametes, as recorded by cinemotomicrography"
"Time-lapse cinemotomicrographs illustrating abnormalities of viscosity, density, and cleavage in developing sea urchins derived from various fertilization combinations of irradiated gametes"
### REPORT OF THE DIRECTOR

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<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Report Title</th>
</tr>
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<tr>
<td>July 25</td>
<td>A. Kent Christensen</td>
<td>&quot;Fine structure of an unusual sperm in the flatworm Plagiostomum&quot;</td>
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<td></td>
<td>Alex B. Novikoff</td>
<td>&quot;Observations on the golgi apparatus and related lysosomes&quot;</td>
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<td>Berta Scharrer</td>
<td>&quot;Functional analysis of the corpus allatum of the insect, Leucophaea maderae, with the electron microscope&quot;</td>
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<td>August 8</td>
<td>Eugene Copeland</td>
<td>&quot;Ultrastructure of teleost swim bladder&quot;</td>
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<td>Philip B. Dunham</td>
<td>&quot;The physiological basis of acclimation of Tetrahymena to high NaCl medium&quot;</td>
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<td>Eugene P. Odum</td>
<td>&quot;Excretion rate of radio-isotopes as indices of metabolic rates in nature: biological half-life of zinc-65 in relation to food consumption, growth and reproduction in arthropods&quot;</td>
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<tr>
<td>August 15</td>
<td>Paul Weiss</td>
<td>&quot;Motion picture records of cell interactions: responses of different cell types to medium, to substratum, and to each other&quot;</td>
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<tr>
<td>August 22</td>
<td>Emilienne Wolff</td>
<td>&quot;In vitro culture of human tumors on explants of chick embryonic organs&quot;</td>
</tr>
</tbody>
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In 1961, the Library received 1730 current journals, 59 new titles having been added during the year. Of the total, the Marine Biological Laboratory subscribed to 509, received 648 in exchange and 192 as gifts. The Woods Hole Oceanographic Institution subscribed to 115, received 204 in exchange and 62 as gifts.

The Laboratory purchased 63 books, received 109 complimentary copies (8 from authors and 101 from publishers) and accepted 62 miscellaneous gifts. The Institution purchased 67 books and received 22 as gifts. The total number of books accessioned totalled 323.

Through purchase, exchange, and gift, the Laboratory completed 16 journal sets and partially completed 25. The Institution completed 7 sets and partially completed 8. There were 2647 reprints added to the collection, of which 1809 were of current issue.

The Library now contains 78,800 bound volumes and 219,099 reprints. There were 535 journal volumes sent out on interlibrary loan and 49 borrowed. About 1200 volumes were bound.

Books and reprints were presented by Drs. Irvine H. Page, John P. Hervey, Kirk Bryan and Roberts Rugh. A set of the Catholic Encyclopedia was given by St. Joseph's College. The Library extends grateful acknowledgment to these generous donors.

In September the Library purchased a photocopying machine. This is for use in supplying (at cost) short articles requested on interlibrary loan. This service eliminates sending out valuable publications and decreases the wear and tear brought about by interlibrary loans. From September through December, 52 requests were filled by photoprints.

The circulation of books and reprints increased greatly, thus emphasizing the trend of growth established during the last few years. The Library facilities are now available, throughout the winter months, to local doctors and to college and high school students. Expansion and improvements are now being planned and the staff looks forward to a year of progress.

Respectfully submitted,
Deborah L. Harlow,
Librarian
VI. REPORT OF THE TREASURER

The market value of the General Endowment Fund and the Library Fund at December 31, 1961, amounted to $2,025,139 as against book value of $1,193,853. This compares with values of $1,796,571 and $1,146,393 at the end of the preceding year. The average yield on the securities was 3.37% of the market value and 5.72% of book value. The total uninvested principal cash in the above accounts as of December 31, 1961, was $1,932. Classification of the Securities held in the Endowment Funds appears in the Auditor’s report.

The market value of the pooled securities as of December 31, 1961, was $373,641 with uninvested principal cash of $283,27; the market value at December 31, 1960 being $333,218. The book value of the securities in this account was $293,068 on December 31, 1961, compared with $274,294 a year earlier. The average yield on market value was 3.39% and 4.32% of book value.

The proportionate interest in the Pool Fund Account of the various Funds as of December 31, 1961, is as follows:

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension Funds</td>
<td>26.109%</td>
</tr>
<tr>
<td>General Laboratory Investment</td>
<td>52.177%</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
<tr>
<td>Bio Club Scholarship Fund</td>
<td>1.494%</td>
</tr>
<tr>
<td>Rev. Arsenius Boyer Scholarship Fund</td>
<td>1.829%</td>
</tr>
<tr>
<td>Gary N. Calkins Fund</td>
<td>1.711%</td>
</tr>
<tr>
<td>Allen R. Memhard Fund</td>
<td>0.332%</td>
</tr>
<tr>
<td>F. R. Lillie Memorial Fund</td>
<td>5.766%</td>
</tr>
<tr>
<td>Lucretia Crocker Fund</td>
<td>6.243%</td>
</tr>
<tr>
<td>E. G. Conklin Fund</td>
<td>1.056%</td>
</tr>
<tr>
<td>M. H. Jacobs Scholarship Fund</td>
<td>0.753%</td>
</tr>
<tr>
<td>Jewett Memorial Fund</td>
<td>0.557%</td>
</tr>
<tr>
<td>Anonymous Gift</td>
<td>1.973%</td>
</tr>
</tbody>
</table>

Donations from the M.B.L. Associates for 1961 were $4,330 as compared with $4,320 for 1960. Unrestricted gifts from foundations, societies and companies amounted to $36,348.

The James Foundation made a gift of $50,000 towards the building of additional housing units in Devil’s Lane which will be ready for occupancy in June, 1962.

We are administering 15 grants for investigators in addition to those grants made directly to the Marine Biological Laboratory for general support and training courses. The amounts of grants vary in accordance with the investigator’s project of research. An amount of 15% based on amount expended is allowed the Laboratory as overhead.

The Lillie Fellowship Fund with a market value of $96,705 and a book value of $92,464, as well as the investment in the General Biological Supply House with a book value of $12,700, is carried in the Balance Sheet, item “Other Investments.” The General Biological Supply House for the fiscal year ended June 30, 1961, had a profit after taxes of $312,000 as compared to $314,034 in 1960 and $303,300 in 1959 and $218,210 in 1958, and $123,430 in 1957. In the fiscal
year 1961, the Marine Biological Laboratory received dividends from the General Biological Supply House of $33,020 as against $30,480 in 1960 and $30,480 in 1959 and $25,400 in 1958.

Following is a statement of the auditors:

*To the Trustees of the Marine Biological Laboratory, Woods Hole, Massachusetts:*

We have examined the balance sheets of the Marine Biological Laboratory as of December 31, 1961 and 1960, the related statements of operation expenditures, income and current fund for the years then ended, and statement of funds for the year ended December 31, 1961. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the account records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements present fairly the assets, liabilities and funds of the Marine Biological Laboratory at December 31, 1961, and the results of its operations for the year then ended.

Boston, Massachusetts
March 16, 1962

Lybrand, Ross Bros. & Montgomery

James H. Wickersham,
Treasurer
### Investments

<table>
<thead>
<tr>
<th>Description</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments held by Trustee:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securities, at cost (approximate market quotation 1961—$2,025,000)</td>
<td>$1,193,853</td>
<td>$1,146,393</td>
</tr>
<tr>
<td>Cash</td>
<td>1,932</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td><strong>1,195,785</strong></td>
<td><strong>1,146,648</strong></td>
</tr>
<tr>
<td>Investments of other endowment and unrestricted funds:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pooled investments, at cost (approximate market quotation 1961—$373,641)</td>
<td>287,340</td>
<td>268,566</td>
</tr>
<tr>
<td>less $5,728 temporary investment of current fund cash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other investments</td>
<td>138,546</td>
<td>137,742</td>
</tr>
<tr>
<td>Cash</td>
<td>12,764</td>
<td>10,839</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>41</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td><strong>1,634,476</strong></td>
<td><strong>1,563,816</strong></td>
</tr>
</tbody>
</table>

### Plant Assets

<table>
<thead>
<tr>
<th>Description</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land, buildings, library and equipment (note)</td>
<td>4,795,960</td>
<td>3,280,059</td>
</tr>
<tr>
<td>Less allowance for depreciation (note)</td>
<td>1,189,121</td>
<td>1,142,879</td>
</tr>
<tr>
<td></td>
<td><strong>3,606,839</strong></td>
<td><strong>2,137,180</strong></td>
</tr>
<tr>
<td>Construction in progress</td>
<td>105</td>
<td>1,455,811</td>
</tr>
<tr>
<td>Cash</td>
<td>82,042</td>
<td></td>
</tr>
<tr>
<td>U. S. Government obligations, at cost:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50,000 Treasury certificates, due 5/15/62</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>3,656,944</strong></td>
<td><strong>3,675,033</strong></td>
</tr>
</tbody>
</table>

### Current Assets

<table>
<thead>
<tr>
<th>Description</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>65,623</td>
<td>77,546</td>
</tr>
<tr>
<td>Temporary investment in pooled securities</td>
<td>5,728</td>
<td>5,728</td>
</tr>
<tr>
<td>Inventories of specimens and Bulletins</td>
<td>43,712</td>
<td>47,641</td>
</tr>
<tr>
<td>Prepaid insurance and other</td>
<td>6,870</td>
<td>16,778</td>
</tr>
<tr>
<td></td>
<td><strong>$ 171,223</strong></td>
<td><strong>$ 207,582</strong></td>
</tr>
</tbody>
</table>
### Endowment Funds

<table>
<thead>
<tr>
<th>Description</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endowment funds given in trust for benefit of the Marine Biological Laboratory</td>
<td>$1,195,785</td>
<td>$1,146,648</td>
</tr>
<tr>
<td>Endowment funds for awards and scholarships:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal</td>
<td>126,302</td>
<td>126,302</td>
</tr>
<tr>
<td>Unexpended income</td>
<td>9,600</td>
<td>7,285</td>
</tr>
<tr>
<td>Total</td>
<td>135,902</td>
<td>133,587</td>
</tr>
<tr>
<td>Unrestricted funds functioning as endowment</td>
<td>206,378</td>
<td>206,378</td>
</tr>
<tr>
<td>Retirement fund</td>
<td>81,790</td>
<td>71,449</td>
</tr>
<tr>
<td>Pooled investments—accumulated gain</td>
<td>14,621</td>
<td>5,754</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,634,476</strong></td>
<td><strong>$1,563,816</strong></td>
</tr>
</tbody>
</table>

### Plant Liability and Funds

<table>
<thead>
<tr>
<th>Description</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funds expended for plant, less retirements</td>
<td>4,796,065</td>
<td>4,668,475</td>
</tr>
<tr>
<td>Less allowance for depreciation charged thereto</td>
<td>1,189,121</td>
<td>1,142,879</td>
</tr>
<tr>
<td>Total</td>
<td>3,606,944</td>
<td>3,525,596</td>
</tr>
<tr>
<td>Unexpended plant funds</td>
<td>50,000</td>
<td>82,042</td>
</tr>
<tr>
<td>Total</td>
<td>3,656,944</td>
<td>3,607,638</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>67,395</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$3,656,944</strong></td>
<td><strong>$3,675,033</strong></td>
</tr>
</tbody>
</table>

### Current Liabilities and Funds

<table>
<thead>
<tr>
<th>Description</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>30,337</td>
<td>41,106</td>
</tr>
<tr>
<td>Unexpended research grants</td>
<td>52,837</td>
<td>51,726</td>
</tr>
<tr>
<td>Unexpended balances of gifts for designated purposes</td>
<td>8,878</td>
<td>9,663</td>
</tr>
<tr>
<td>Current fund</td>
<td>79,171</td>
<td>105,087</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$171,223</strong></td>
<td><strong>$207,582</strong></td>
</tr>
</tbody>
</table>

Note—The Laboratory has since January 1, 1916, provided for reduction of book amounts of plant assets and funds invested in plant at annual rates ranging from 1% to 5% of the original cost of the assets.
## MARINE BIOLOGICAL LABORATORY

### STATEMENTS OF OPERATING EXPENDITURES, INCOME AND CURRENT FUND

**Years Ended December 31, 1961 and 1960**

#### Operating Expenditures

<table>
<thead>
<tr>
<th>Item</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and accessory services</td>
<td>$268,193</td>
<td>$250,578</td>
</tr>
<tr>
<td>Instruction</td>
<td>158,780</td>
<td>219,234</td>
</tr>
<tr>
<td>Library and publications</td>
<td>67,189</td>
<td>61,462</td>
</tr>
<tr>
<td>Direct costs on research grants</td>
<td>177,938</td>
<td>182,899</td>
</tr>
<tr>
<td>Administration and general</td>
<td>83,366</td>
<td>70,037</td>
</tr>
<tr>
<td>Plant operation and maintenance</td>
<td>118,993</td>
<td>117,980</td>
</tr>
<tr>
<td>Dormitories and dining</td>
<td>160,838</td>
<td>162,713</td>
</tr>
<tr>
<td>Additions to plant from current income</td>
<td>27,210</td>
<td>78,654</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>672,100</strong></td>
<td><strong>714,173</strong></td>
</tr>
</tbody>
</table>

Less depreciation included in plant operation and dormitories and dining above but charged to plant funds 48,419 48,086

**Total Operating Expenditures** 1,014,088 1,095,471

#### Income

<table>
<thead>
<tr>
<th>Item</th>
<th>1961</th>
<th>1960</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research fees</td>
<td>102,081</td>
<td>56,408</td>
</tr>
<tr>
<td>Accessory services (including sales of biological specimens, 1961—$43,045, 1960—$48,817)</td>
<td>86,790</td>
<td>151,109</td>
</tr>
<tr>
<td>Instruction fees</td>
<td>27,730</td>
<td>23,905</td>
</tr>
<tr>
<td>Grants for instruction and research training</td>
<td>148,078</td>
<td>185,571</td>
</tr>
<tr>
<td>Library fees, Bulletin subscriptions and other</td>
<td>39,575</td>
<td>35,174</td>
</tr>
<tr>
<td>Reimbursements and allowances for direct and indirect costs on research grants</td>
<td>195,716</td>
<td>221,197</td>
</tr>
<tr>
<td>Dormitories and dining income</td>
<td>123,231</td>
<td>105,086</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>723,201</strong></td>
<td><strong>778,450</strong></td>
</tr>
</tbody>
</table>

Gifts used for current expenses 40,468 48,300

Grants used for current expenses 114,170 143,018

Investment income used for current expenses 110,333 105,066

**Total current income** 988,172 1,078,834

Excess of operating expenditures over current income 25,916 20,637

Current fund balance January 1 105,087 125,724

Current fund balance December 31 $79,171 $105,087
# MARINE BIOLOGICAL LABORATORY

## Statement of Funds

Year Ended December 31, 1961

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Invested funds ......</td>
<td>$1,563,816</td>
<td>$76,274</td>
<td>$116,909</td>
<td>$108,863</td>
<td>$13,660</td>
</tr>
<tr>
<td>Unexpended plant funds</td>
<td>$82,042</td>
<td>63,290</td>
<td></td>
<td></td>
<td>95,332</td>
</tr>
<tr>
<td>Unexpended research grants</td>
<td>$51,726</td>
<td>468,319</td>
<td>467,208</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unexpended gifts for designated purposes</td>
<td>$9,663</td>
<td>40,678</td>
<td>40,468</td>
<td>995</td>
<td></td>
</tr>
<tr>
<td>Current fund .......</td>
<td>$105,087</td>
<td>25,916</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$648,561</td>
<td>$116,909</td>
<td>$642,455</td>
<td></td>
<td>$109,987</td>
</tr>
</tbody>
</table>

Gifts .......................... | 103,968  
Grants for research, training and support .... | 468,319  
Net gain on sales of securities ............ | 58,004  
Appropriated from current income and other ... | 18,270  
Expended for construction of new building .... | 95,332  
Scholarship award ............ | 2,700  
Payments to pensioners .. | 10,960  
Other .......................... | 995  

$109,987
Securities held by Trustee:

<table>
<thead>
<tr>
<th>Securities Held by Trustee</th>
<th>General Endowment Fund</th>
<th>General Educational Board Endowment Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Government securities</td>
<td>$35,110 3.6% 35.963 2.1% 1,651</td>
<td>31,040 15.1% 31,853 9.2% 1,491</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>514,520 52.0% 501,318 29.8% 20,625</td>
<td>86,679 42.3% 87,550 25.3% 3,125</td>
</tr>
<tr>
<td>Preferred stocks</td>
<td>84,778 8.6% 73,012 4.4% 3,283</td>
<td>26,745 13.0% 25,312 7.3% 1,160</td>
</tr>
<tr>
<td>Common stocks</td>
<td>354,366 35.8% 1,069,462 63.7% 31,399</td>
<td>60,615 29.6% 200,669 58.2% 5,649</td>
</tr>
<tr>
<td>Total</td>
<td>988,774 100.0% 1,679,755 100.0% 56,958</td>
<td>205,079 100.0% 345,384 100.0% 11,425</td>
</tr>
</tbody>
</table>

Investments of other endowment and unrestricted funds:

<table>
<thead>
<tr>
<th>Investments of Other Endowment and Unrestricted Funds</th>
<th>Pooled Investments</th>
<th>Other Investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Government securities</td>
<td>$1,193,853</td>
<td>$138,546</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>$2,025,139</td>
<td>$350</td>
</tr>
<tr>
<td>Preferred stocks</td>
<td>$68,383</td>
<td>$1,998</td>
</tr>
<tr>
<td>Common stocks</td>
<td></td>
<td>$131</td>
</tr>
<tr>
<td>Real estate</td>
<td></td>
<td>$34,195</td>
</tr>
<tr>
<td>Total investments of other endowment and unrestricted</td>
<td>$1,332,099</td>
<td>$36,674</td>
</tr>
<tr>
<td>funds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total investment income</td>
<td>$431,614</td>
<td>$49,348</td>
</tr>
<tr>
<td>Custodian's fees charged thereto</td>
<td></td>
<td>$117,731</td>
</tr>
<tr>
<td>Income of current funds temporarily invested in pooled</td>
<td></td>
<td>(577)</td>
</tr>
<tr>
<td>securities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment income distributed to funds</td>
<td></td>
<td>$116,909</td>
</tr>
</tbody>
</table>