

LONG ISLAND BIOLOGICAL ASSOCIATION

ANNUAL REPORT

OF

THE BIOLOGICAL LABORATORY

COLD SPRING HARBOR
LONG ISLAND, NEW YORK

1944

LONG ISLAND BIOLOGICAL ASSOCIATION

INCORPORATED 1924

ANNUAL REPORT
OF
THE BIOLOGICAL LABORATORY

FOUNDED 1890

FIFTY-FIFTH YEAR

1 9 4 4

TABLE OF CONTENTS

| | Page |
|--|------|
| The Long Island Biological Association | |
| Officers | 5 |
| Board of Directors | 5 |
| Committees | 6 |
| Members | 7 |
| Women's Auxiliary Board | 10 |
| "Forecast of Peace", Dr. Robert Cushman Murphy | 12 |
| Report of Director | 13 |
| Report of Wildlife Study Course | 19 |
| Reports of Investigators | 20 |
| Cold Spring Harbor Symposia Publications | 28 |
| Laboratory Staff | 29 |
| Summer Research Investigators | 29 |
| Report of the Secretary, L. I. B. A. | 30 |
| Report of the Treasurer, L. I. B. A. | 30 |

THE LONG ISLAND BIOLOGICAL ASSOCIATION

President

Robert Cushman Murphy

Vice-President

Arthur W. Page

Secretary

Charles B. Davenport (died Feb. 18th)

Vice-President and Treasurer

Marshall Field

E. C. MacDowell (elected July 25th)

Assistant Secretary

Asst. Treasurer and Auditor

William F. Dean

B. P. Kaufmann

Director of The Biological Laboratory, M. Demerec

BOARD OF DIRECTORS

To serve until 1948

W. H. Cole.....Rutgers University
Mrs. George S. Franklin.....Cold Spring Harbor, N. Y.
E. C. MacDowell.....Cold Spring Harbor, N. Y.
William B. Nichols.....Syosset, N. Y.
Roland L. Redmond.....Oyster Bay, N. Y.
B. H. Willier.....Johns Hopkins University

To serve until 1947

Charles M. Bleecker.....Cold Spring Harbor, N. Y.
Marshall Field.....Huntington, N. Y.
Ross G. Harrison.....Yale University
B. P. Kaufmann.....Carnegie Institution
Arthur W. Page.....Huntington, N. Y.
Harlow Shapley.....Harvard University

To serve until 1946

Robert Chambers.....New York University
George W. Corner.....Carnegie Institution of Washington
Th. Dobzhansky.....Columbia University
Mrs. Van S. Merle-Smith.....Oyster Bay, N. Y.
John M. Schiff.....Oyster Bay, N. Y.
Harold C. Urey.....Columbia University
Willis D. Wood.....Huntington, N. Y.

To serve until 1945

M. Demerec.....The Biological Laboratory
Henry Hicks.....Westbury, N. Y.
Stuart Mudd.....University of Pennsylvania Medical School
Robert Cushman Murphy.....American Museum of Natural History
Acosta Nichols.....Oyster Bay, N. Y.
John K. Roosevelt.....Oyster Bay, N. Y.

Members Emeriti

R. C. Leffingwell.....Oyster Bay, N. Y.
Henry L. Stimson.....Huntington, N. Y.
H. E. Walter.....Providence, R. I.

EXECUTIVE COMMITTEE

| | |
|-----------------------|-------------------|
| †C. B. Davenport | Arthur W. Page |
| E. C. MacDowell | John K. Roosevelt |
| Robert Cushman Murphy | Harold C. Urey |
| William B. Nichols | |

FINANCE COMMITTEE

| | | |
|----------------|--------------------|----------------|
| Marshall Field | William B. Nichols | Willis D. Wood |
|----------------|--------------------|----------------|

BUILDINGS AND GROUNDS COMMITTEE

Mrs. George S. Franklin, Chairman

| | |
|------------------------|--------------------|
| Mrs. Percy H. Jennings | B. P. Kaufmann |
| Henry Hicks | William B. Nichols |

SCIENTIFIC ADVISORY COMMITTEE

George W. Corner, Chairman

| | |
|----------------------|------------------|
| L. C. Dunn | E. C. MacDowell |
| Alexander Hollaender | Alfred E. Mirsky |

†Deceased

Members of the Long Island Biological Association

Founders

By contribution of at least \$5,000 in money or property

| | |
|-------------------------|--------------------------------|
| Carnegie Corporation | John & Mary Markle Foundation |
| Mrs. Ethel Clyde | Mrs. Van Santvoord Merle-Smith |
| Mrs. Henry W. de Forest | Acosta Nichols |
| Mrs. Leonard Elmhirst | Mrs. Acosta Nichols |
| Marshall Field | Arthur W. Page |
| Mrs. Walter B. James | Rockefeller Foundation |
| Mrs. Otto H. Kahn | John M. Schiff |
| Russell C. Leffingwell | Wawepex Society |
| Deceased | |
| Mrs. Eugene Blackford | William J. Matheson |
| Henry W. de Forest | J. P. Morgan |
| Dr. Walter B. James | Mortimer L. Schiff |
| Walter Jennings | William K. Vanderbilt |
| John D. Jones | Col. T. S. Williams |
| Wilton Lloyd-Smith | Robert B. Woodward |

Patrons

By contribution of at least \$500

| | |
|---------------------------|-------------------------------|
| Charles M. Bleecker | Van Santvoord Merle-Smith |
| Miss Rosina Boardman | A. G. Milbank |
| John Chase | Mrs. George Nichols |
| W. R. Coe | Frederick B. Pratt |
| Mrs. Charles B. Davenport | Herbert L. Pratt |
| John W. Davis | Victor Rakowsky |
| Mrs. Henry W. de Forest | John K. Roosevelt |
| W. E. Erhart | Walter J. Salmon |
| S. A. Everitt | Carl J. Schmidlapp |
| Childs Frick | Donald Scott |
| Hugo Fricke | Howard C. Smith |
| Princess Andrew Gagarin | Henry L. Stimson |
| Mrs. Walter Jennings | Henry C. Taylor |
| Alfred Ephraim Kornfeld | William C. Whitney Foundation |
| Russell C. Leffingwell | George Whitney |
| Gerald M. Livingston | Willis D. Wood |
| Mrs. Wilton Lloyd-Smith | Mrs. Willis D. Wood |
| Deceased | |
| James C. Ayer | Robert W. de Forest |
| Frank L. Babbott | Mrs. Robert W. de Forest |
| Eugene Blackford | Cleveland H. Dodge |
| Nicholas F. Brady | F. N. Doubleday |
| Thomas Cochran | Edward Floyd-Jones |
| Paul D. Cravath | Edward S. Harkness |
| Charles B. Davenport | Mrs. E. H. Harriman |

Reginald G. Harris
A. Augustus Healy
August Heckscher
Anton G. Hodenpyl
Frank S. Jones
Oliver L. Jones
Miss Mabelle F. Lane
Ogden L. Mills
William H. Nichols, Jr.
Henry F. Noyes
Isaac R. Oeland

David Aboff
Harold A. Abramson
Winthrop W. Aldrich
Justin M. Andrews
Henry F. Atherton
H. A. Baylis
Dennistoun M. Bell
Helen Benson
Frederick Bernheim
Mrs. John E. Berwind
Charles M. Bleecker
T. Bache Bleecker
Edward C. Blum
Harold F. Blum
D. Bodenstein
George Bowdoin
Vernon Bryson
Dean Burk
McKeen Cattell
Robert Chambers
John Chase
F. S. Child
H. B. Child
Edward D. Churchill
Elizabeth R. Cole
Kenneth S. Cole
William H. Cole
Henry S. Conard
George W. Corner
Paul Cushman
W. N. Davey
F. Trubee Davison
Max Delbruck
M. Demerec
Abigail C. Dimon
Th. Dobzhansky

George D. Pratt
Harold I. Pratt
Cornelia Prime
Oran W. Rice
W. Emlen Roosevelt
Mrs. W. Emlen Roosevelt
Clarence W. Seamans
Louis C. Tiffany
Walter J. Whipple
Mrs. Timothy S. Williams

Sustaining Members

Ugo Fano
Marshall Field
Ernst Fischer
Alexander Forbes
Childs Frick
Ralph W. Gerard
H. Bentley Glass
Myron Gordon
Charles V. Graham
Susan A. Green
Ross G. Harrison
Miner C. Hill
Alexander Hollaender
Gail H. Holliday
Davenport Hooker
G. Beekman Hoppin
Mrs. S. C. W. Hoppin
Clarence A. Horn
Mrs. Walter B. James
Mrs. Walter Jennings
Everett C. Jessup
E. Elizabeth Jones
B. P. Kaufmann
Frances Kuchler
Mrs. Ruth Ledyard
Mrs. Wilton Lloyd-Smith
S. E. Luria
E. C. MacDowell
Duncan A. MacInnes
Ward Melville
Mrs. Van Santvoord Merle-Smith
Leo M. Meyer
Dudley H. Miles
Alfred E. Mirsky
Louis de B. Moore
Mrs. Louis de B. Moore

Henry S. Morgan
Stuart Mudd
James Murphy
Robert Cushman Murphy
James Neel
Acosta Nichols
William B. Nichols
Charles Packard
Arthur W. Page
G. H. Parker
John C. Parker
Francis T. P. Plimpton
James S. Potter
Henry S. Pratt
Richardson Pratt
Isaac Prussin
Otto Rahn
Nicolas Rashevsky
Roland Redmond
Oscar W. Richards
Harry C. Robb
John K. Roosevelt
S. A. Salvage
Charles E. Sammis, Inc.

John M. Schiff
Francis O. Schmitt
Schwartz Brothers
Harlow Shapley
Ida Sitler
B. Sonnenblick
Carl C. Speidel
Henry L. Stimson
George F. Sykes
T. Campbell Takami
Henry C. Taylor
Isabel H. Tuthill
Harold C. Urey
Roy A. Waggener
H. E. Walter
Harry E. Warmke
Charles O. Warren
Katherine Brehme Warren
Wawepex Society
B. H. Willier
Willis D. Wood
W. Wilton Wood
Sewall Wright
S. Zamenhof

The following, though not members of the Long Island Biological Association, have contributed to the Land and Endowment Fund:

E. LeGrand Beers
Albert D. Silver
J. G. Dettmer
William G. Loew
John Hill Morgan

Acosta Nichols, Jr.
George Lane Nichols
C. J. Peabody
James H. Post
W. A. Putnam
Herman Stutzer

WOMEN'S AUXILIARY BOARD

President—Mrs. George S. Franklin

Vice-President—Mrs. Van Santvoord Merle-Smith

Secretary—Mrs. Alvin Devereux

Treasurer—Mrs. Gordon S. Rentschler

Chairman, House Committee—Mrs. Percy H. Jennings

Chairman, Membership Committee—Mrs. John C. Hughes

Benefactors

(By contribution of \$100 or more)

Mrs. F. Huntington Babcock

Mrs. G. Beekman Hoppin

Mrs. Walter Jennings

Mrs. Van Santvoord Merle-Smith

Mrs. Acosta Nichols

Mrs. Roland Redmond

Sustaining Members

(By contribution of \$10 or more)

Mrs. H. A. Abramson

Mrs. Henry Anderson

Mrs. Francis D. Bartow

Mr. Charles B. Belt

Mrs. Charles B. Belt

Mrs. Wyllys R. Betts

Mrs. Charles Blecker

Mrs. Kenneth S. Boardman

Mrs. Trowbridge Callaway

Mrs. C. T. Church

Mr. C. T. Church

Mrs. Henry P. Davison

Mrs. Henry L. de Forest

Mrs. Henry W. de Forest

Mrs. Alvin Devereaux

Mrs. Frank N. Doubleday

Mrs. John Foster Dulles

Mrs. Walter K. Earle

Mrs. George S. Franklin

Mrs. Childs Frick

Mrs. William B. Given

Mrs. Winston Hagen

Mrs. Paul Hammond

Mrs. John C. Hughes

Mrs. Henry James

Mrs. Oliver B. James

Mrs. Walter B. James

Mrs. Percy H. Jennings

Mrs. Otto Kahn

Mrs. Hugh Knowlton

Mrs. Russell C. Leffingwell

Mrs. Wilton Lloyd-Smith

Mrs. Ray Morris

Mrs. George Nichols

Mrs. William B. Nichols

Mrs. D. Grinnell Noyes

Miss Isabel Peters

Mrs. Harold I. Pratt

Mrs. Lansing P. Reed

Mrs. Gordon S. Rentschler

Mrs. Philip J. Roosevelt

Mrs. Theodore Roosevelt, Sr.

Mrs. Stanley M. Rumbough

Mrs. J. Barstow Smull

Mrs. Henry L. Stimson

Mrs. Francis M. Weld

Mrs. Willis D. Wood

Members

(By contribution of \$5)

| | |
|-----------------------------|----------------------------|
| Mrs. Charles E. Ames | Mrs. Miner C. Hill |
| Mrs. J. Howland Auchincloss | Mrs. S. C. W. Hoppin |
| Mrs. Daniel Bacon | Mrs. George Hornblower |
| Mrs. T. Bache Bleecker | Mrs. Myron Jackson |
| Miss Rosina Boardman | Mrs. Frederic R. King |
| Mrs. Herbert Bodman | Mrs. Francis S. Kinney |
| Mrs. George E. Brower | Mrs. Robert B. Meyer |
| Mrs. Henry E. Coe, Jr. | Mrs. Robert Cushman Murphy |
| Mrs. Paul Cushman | Mrs. D. Chester Noyes |
| Mrs. F. Trubee Davison | Mrs. Arthur Page |
| Mrs. M. Demerec | Mrs. John E. Rousmaniere |
| Mrs. Richard Derby | Mrs. Donald Scott |
| Mrs. James A. de Tomasi | Mrs. Charles J. Symington |
| Mrs. Fairman R. Dick | Mrs. Henry C. Taylor |
| Mrs. Russell Doubleday | Miss Dorothy Truesdell |
| Mrs. Albert H. Ely, Jr. | Mrs. Donaldson Tucker |
| Mrs. Luis J. Francke | Miss Marguerite Valentine |
| Mrs. Hamilton Hadden | Mrs. H. E. Walter |
| Mrs. Ashton Hawkins | |

Honorary Members

| | |
|----------------------|--------------------------|
| Mrs. Robert Bacon | Mrs. Leonard K. Elmhirst |
| Mrs. Andrew Carnegie | †Mrs. E. H. Harriman |
| | †Mrs. Anton G. Hodenpyl |

†Deceased

FORECAST OF PEACE

The title is not intended to encourage undue optimism nor to divert us from the drive and sacrifice that still lie between today and Victory. Nevertheless, progress of the war has permitted the interests of the Laboratory to begin to flow back into normal channels. That hope should run ahead of realization makes for sound planning. Thus there was no loss or waste in the careful consideration given to a Symposium for the summer of 1945, even though the program had once again to be postponed.

The number of research workers in residence in 1944 was larger than that of the preceding summer, and 1945 is bringing us a step nearer return to the piping times of peace. Present research is concentrating on bacteria and bacteriophages, the latter being the vital agents, present in intestinal tracts, that "eat" or destroy microorganisms. The Radio Corporation of America has generously lent us an electron microscope to aid in prosecution of the studies. A team of twelve or more advanced workers is tackling coordinated problems; and Professor Delbruck, of Vanderbilt University, is conducting a course in the methodology, which is being attended by men and women already distinguished in related branches of sciences.

For the moment this is as close as we can approach toward building our regime around the usual annual Symposium, but the future is brightening like the first glow of dawn. Whenever we can swing again into full stride, whenever the wheels of carefree transportation can roll, the members of the Long Island Biological Association will owe themselves a rousing celebration at Cold Spring Harbor. It should be a sort of scientific revival that will win many converts to the creed which has meant so much in war only because its apostles had already labored so long and constructively in peace.

ROBERT CUSHMAN MURPHY, President
The Long Island Biological Association, Inc.

REPORT OF THE DIRECTOR

Another war year has passed and we are that much closer to the end of the war and to that time when scientists who are at present engaged in military service or in war research, or preoccupied with teaching, will be free once more to go where they wish, to spare time for productive leisure, and to spend their summers at laboratories like ours.

During this past year our Laboratory functioned well in some fields; in others it operated under a handicap or had to suspend activity entirely. We were successful in work on the war research project, and had a reasonably busy summer season, but were not able to resume our Symposium program. We anticipated that conditions would improve next year, and so several conferences were held to discuss plans for the Symposium for the summer of 1945. A topic had been selected and an outline of the program worked out, in cooperation with the Scientific Advisory Committee, when the government regulations concerning conventions were promulgated. It was felt that our meeting would fall within the restrictions; and after full and careful consideration by the Board of Directors at its January 1945 meeting it was decided to postpone the Symposium until 1946.

During the year 1944 the Laboratory suffered a heavy loss through the deaths of two of its prominent supporters, Doctor Charles Benedict Davenport, director of the Laboratory from 1898 to 1922 and secretary of the Association since that time, and Mr. William Kissam Vanderbilt, for twenty years a member of the Board of Directors. Their deaths occurred early in the year, before the report for 1943 went to press, so that the resolutions adopted by the Board, as well as an obituary of Dr. Davenport, were included in that report.

While the manuscript of the present report was in preparation another grave loss was sustained by the Association with the death of Mr. Acosta Nichols on February 8, 1945. He had been a member of the Board of Directors since 1927, and a member of its Executive Committee from 1930 through 1940. In 1927 he and Mrs. Nichols gave to the Laboratory a fund which was used in building the George Lane Nichols Memorial Laboratory.

War Research

This was the second full year that three of our buildings (the Walter B. James Laboratory, the Davenport Laboratory, and Urey Cottage) were used for war research by the Airborne Instruments Laboratory, a group of physicists working under contract with the OSRD. Because of changed requirements brought about by the progress of the war, their program is now being reorganized; and by the end of February 1945, they will complete the experiments that have been carried on at Cold Spring Harbor and will cease using our buildings. Release of these laboratories is welcome, for we will be able to use them to good advantage in our own work next summer.

Since September 1942 the Laboratory has been conducting research under contract with the Chemical Warfare Service. During that period we have had two contracts and three supplementary agreements extending one

of them. The last of these agreements provides for our work through July 1945. This research is financed by appropriations totaling \$32,502, made jointly by the Josiah Macy, Jr. Foundation and the War Department. During the past year we have worked mainly on three projects:

(1) The first of these deals with air decontamination. Using the Cold Spring Harbor Aerosolizer, a study is being made of the effects of fine mists of hypochlorite on airborne bacteria. In this work we are cooperating with the Army Air Force Medical Laboratory, making practical tests in barracks at Mitchel Field.

(2) The Laboratory is cooperating with the Air Surgeon General's Office in the development and testing of plastic nebulizers.

(3) The Laboratory was successful in developing a technique for application of penicillin through the lungs in the form of a fine mist. It has been found that penicillin does not lose its potency when mixed with air, and that when it is inhaled as an aerosol it reaches the fine alveoli of the lungs. Further, it has been determined that penicillin can be taken into the body by inhalation in quantities similar to those administered by intravenous or intramuscular injections. In many instances the inhalation method is preferable to injections, particularly when it is desirable to apply penicillin to the lungs. This method is now in clinical use by a number of physicians.

As a by-product of this research with penicillin at the Biological Laboratory, a study has been completed at the Carnegie Institution laboratory on the origin of bacterial strains resistant to penicillin.

Throughout the year the George Lane Nichols Memorial Laboratory was used for work on our war-research program.

Research

Last summer there were more research workers staying at the Laboratory than during the preceding summer, but not nearly so many as in prewar times. Again this year, as during the summers of two and three years ago, work on the genetics of *Drosophila* (the vinegar fly) was well represented. Professor Th. Dobzhansky of Columbia University moved his laboratory to Cold Spring Harbor. He and his group (B. Spassky, Irene Markreich, and George Streisinger), together with Dr. Ernst Mayr of The American Museum of Natural History, investigated a number of problems dealing with the mechanisms responsible for preserving sexual isolation in species of flies which interbreed readily. These so-called "isolating mechanisms" are important factors in organic evolution, and an understanding of them will play a significant role in extending our knowledge of evolutionary processes. Professor Curt Stern, of The University of Rochester, worked with *Drosophila* in order to obtain information about the action of genes. These, as is well known, are the units of heredity, which are strung along thread-like bodies called chromosomes in the cells of an organism. By the use of X-rays it is possible to break chromosomes in such a way that the broken pieces will unit with other broken ends in new combinations. In such cases the genes near the attachment points are brought into the neighborhood of alien genes, and frequently their action is affected to such an

extent that the change can be detected experimentally. Dr. Stern is studying the action of certain genes in their natural genic environment and also when this has been changed through chromosome breakage and re-attachment.

Dr. Jack Schultz, of the Lankenau Hospital Research Institute, Philadelphia, analyzed his maize material from experiments designed to compare the effects of X-rays and of ultraviolet irradiation on hereditary changes. Dr. Schultz and Mrs. Schultz (Dr. Helen Redfield) experimented with *Drosophila*; and Dr. Schultz, assisted by Miss Patricia St. Lawrence, made an intensive study of the structure of human chromosomes.

Prof. M. Delbruck, of Vanderbilt University, Nashville, Tennessee, continued the studies with bacteriophages which he had conducted at the Laboratory in previous summers. He investigated various properties of seven different phages that attack the same strain of bacteria.

Doctors Marta and Otto Lowenstein of the New York University Medical College studied the relationship between a certain part of the brain and the pupillary movements of the eye. Another problem having medical application was investigated by Dr. L. M. Meyer of the Kings County Hospital, Brooklyn, New York. Using rats as experimental material, he studied the effect of intramuscular injections of methyl acetamide and para-chloro-xyleneol on the peripheral blood and bone marrow.

A number of investigators who were unable to spend a larger part of the summer with us came for brief periods, either to work or to discuss their problems with other members of our group. Dr. Alfred Mirsky of the Rockefeller Institute, Major Harold Abramson of the Chemical Warfare Service, and Dr. W. Albert Noyes, Jr. of The University of Rochester were frequent visitors. Dr. James Neel of The University of Rochester spent a brief vacation working on a manuscript dealing with the inheritance of Cooley's anemia.

More detailed accounts of some of the research projects listed above are given in a later section of this report (Reports of Investigators).

Lectures

As in all other activities, there was close cooperation between the Laboratory and the Department of Genetics in arrangements for lectures and seminar sessions. The regular thirty-minute seminars held three times a week at the Department of Genetics were attended by the members of the Laboratory. These sessions were devoted to reviews of current literature and brief reports about current research.

Technical lectures were given weekly by members of the Laboratory and members of the Department of Genetics. Again this year, they were held on Thursday afternoon rather than in the evening, in order to accommodate those who work at the laboratories but live at a distance. Arrangements for these lectures were in charge of Mr. E. L. Lahr, who was chairman of the Journal Club at the Department of Genetics. Titles are listed below:

June 1: J. A. Moore, Barnard College. Studies on the hybrids of eastern American frogs.

- June 8: M. Demerec, Department of Genetics. Mutations in bacteria to resistance to bacteriophage.
- June 22: James V. Neel, The University of Rochester. A hematology and genetical study of the transmission of thallemia.
- July 6: Th. Dobzhansky, Columbia University. Sexual isolation in *Drosophila*.
- July 13: W. F. Hollander, Department of Genetics. The present status of pigeon and dove genetics.
- July 21: W. E. Heston, National Cancer Institute. The genetics of tumor development.
- July 27: Myron Gordon, New York Zoological Society. Opposing types of genetic sex-determination found in wild and in domesticated populations of *Platypocilus maculatus*.
- August 3: Jack Schultz, Lankenau Hospital Research Institute. Heterochromatin and male sterility in *Drosophila*.
- August 10: S. E. Luria, Indiana University. Bacteriophage mutants.
- August 17: Leo M. Meyer, Brooklyn, New York. The bone marrow in various hematological disorders.
- August 24: M. Delbruck, Vanderbilt University. Experiments on interference between bacterial viruses.
- Because of transportation difficulties, the general evening lectures were omitted again this year.

Winter Meeting of the Women's Auxiliary Board

Under the leadership of Mrs. George S. Franklin, the Women's Auxiliary organized a tea at the home of Mr. and Mrs. Russell C. Leffigwell, to which members and friends of the Association were invited. The gathering was held on March 20, 1944, but notwithstanding the lateness of the season one of the heaviest snowstorms of the winter occurred on that day. Considering the unfavorable weather, the meeting was well attended. More than 50 guests registered with Mrs. Alvin Devereux, Secretary of the Auxiliary.

After an informal tea the meeting was opened by Mrs. Franklin, who welcomed the members of the Association and other guests. Dr. Robert Cushman Murphy, President of the Association, gave an illuminating talk stressing the interest of the progressive members of the community in the Laboratory, and the contribution of the Laboratory to the life of the community, as well as to American science and world science. This talk was published in the May 19 issue of *Science* under the title: "The Biological Laboratory at Cold Spring Harbor." The Director spoke about the current program of the Laboratory. He pointed out that the Laboratory is a research center, used by scientists during those periods of the year (chiefly the summer months) when they are free from teaching and other regular duties. It is the center for the Cold Spring Harbor Symposia on Quantitative Biology, which are annual scientific gatherings attended by an international group of biologists, physicists, chemists and mathematicians for discussion of specific problems of common interest. The Laboratory is also an educational center, offering advanced training to selected groups of students and research workers, as well as a general course in wildlife

study to young people of the community; and during the summer months it arranges and presents a series of technical and popular lectures on outstanding scientific topics. It is a meeting ground and "melting pot" for scientific ideas, because it facilitates contacts between scientists from many parts of the country and from other countries. It has also participated in war research, by carrying on a project under contract with the War Department and by making its buildings available to a group of physicists working under contract with the Government.

An exhibit had been set up, showing samples of materials used in research at the Laboratory. This included a demonstration of several hereditary characteristics of the vinegar fly, *Drosophila*. The inheritance of more than 500 characters, such as those that were shown, has been investigated in this fly, and results of these studies have helped in formulating the basic structure of the modern science of heredity, known as genetics. A number of the known hereditary characteristics in corn (maize) were also demonstrated. This plant is used extensively in studies of heredity, and some work with it has been done at the Laboratory. Several strains of mice were shown, representing a useful material for studies of heredity in higher animals as well as for many physiological and medical experiments. Another demonstration showed Mexican fish, which are used for studies of the inheritance of color, form, sex, susceptibility to tumor, and a number of other features. The exhibits also included a demonstration of penicillin, of the fungus *Penicillium* which produces it, and of a method for determining its potency. Several cultures showing bacteriophages were on display.

Scholarships

The John D. Jones Scholarship supported the work of Dr. Jack Schultz; while the Dorothy Frances Rice and the Temple Prime Scholarships were used to cover the laboratory expenses of other members.

Other Activities

Stringent rationing of gasoline prevented members from visiting in the neighborhood and made it impossible for friends to visit the Laboratory. The open-house days held in the past were omitted this year.

Plots for victory gardens were again available to members of the Laboratory and of the Department of Genetics on the Henry W. de Forest Gift lot. A number of families took advantage of this opportunity to raise their own vegetables.

Dining Room

Owing to the labor shortage, rationing difficulties, and the fact that the Symposium was not held this year, it was found impractical to open the Blackford Hall dining room. Members of the Laboratory who were here for short periods or were unable to provide meals for themselves, were accommodated at the dining room of the Department of Genetics, Carnegie Institution.

Laboratories and Equipment

The George Lane Nichols Memorial Laboratory was reserved for work on our war research project; the Walter B. James Laboratory and the Dav-
enport Laboratory were used for physical war research; and Wawepex

Laboratory and the John D. Jones Laboratory were available for our regular work. Some new equipment was acquired for permanent possession in connection with the war research carried on by the Laboratory.

Buildings and Grounds

The hurricane that occurred on September 14, 1944, destroyed a great many trees but fortunately did only minor damage to buildings. The storm produced extensive changes on the Sand Spit beach. The sea wall at the northwestern end was demolished and the shore was washed out to an average depth of four feet for a distance of about fifty feet. Over a large area of the Spit, however, one to two feet of sand was deposited.

Major repairs to buildings during the year included a new roof and outside paint on the Stewart Cottage, and new flooring in the five basement rooms of the Harris House. Other work on buildings consisted of minor repairs and painting.

Acknowledgments

It gives me great pleasure to acknowledge the support given to the Laboratory by the members of the Long Island Biological Association. It is owing primarily to their interest and generosity that the Laboratory has become an outstanding scientific center and is continuing in that status.

The Women's Auxiliary Board, under the presidency of Mrs. George S. Franklin, made an important contribution toward the support of the scientific work of the Laboratory; and the House Committee of the Board, under the chairmanship of Mrs. Percy H. Jennings, collected furniture for residences and contributions for the purchase of additional furnishings.

Acknowledgment is also made of the contribution of the Wawepex Society toward the upkeep of buildings and grounds, of the John D. Jones Scholarship maintained by that Society, and of the special library fund contributed this year for the second time.

The Laboratory is grateful to the Josiah Macy, Jr. Foundation for its grant in support of the war research project.

We wish to acknowledge also the assistance given by the Carnegie Institution, and particularly the opportunity for close cooperation with the Department of Genetics, which is proving very helpful to the work of the Laboratory.

M. Demerec, Director

WILDLIFE STUDY COURSE FOR YOUNG PEOPLE

Dr. Myron Gordon

New York Zoological Society, New York, N. Y.

The purpose of the Wildlife Study Course is to acquaint young people with the rich and varied plant and animal life within the Cold Spring Harbor area and to help them relate the natural life about them to their own experiences.

The Biological Laboratory is situated at the center of a variety of ecological areas, and thus is admirably located for the study of wildlife. Organisms from both fresh and salt water may be collected and studied. Heavily forested areas and open meadows provide contrasting types of vegetation, which in turn give shelter to a number of animal communities. The sandy beaches of the Sand Spit and the shores of nearby fresh-water lakes provide a contrast in the types of organisms living at each locality. All of these ecological areas are within a short walking distance of Wawepex Laboratory, the headquarters of the Wildlife Study Course.

The program of this year's course followed closely the outline of the course given last summer. Since this was published in the last Annual Report, it will not be repeated here.

The following is a list of the students enrolled in the course:

| | |
|--------------------------|---------------------|
| Abramson, Sandra | Nichols, William T. |
| Ayer, William | Paterson, Thomas |
| Colgate, Stephen | Schultz, Peter |
| Conly, Carroll | Schulz, Frederick |
| Hartman, Peter | Siebert, Yvonne |
| Hawkins, Lisa | Walton, Mary |
| Jannicky, Lyn | Walton, Richard |
| Jannicky, Tony | Warmke, Bobbie |
| Mayr, Christine | Weissmann, Phyllis |
| Munder, Fred | White, Roger |
| Nichols, Francis T., Jr. | |

REPORTS OF INVESTIGATORS

Bryson, Vernon, Biological Laboratory, Cold Spring Harbor, N. Y. —Even in wartime the activity of the Biological Laboratory has remained close to the frontiers of science. And as frontiersmen, our modest achievements assume importance or grow through the interest of those to whom we give over our findings. We have, therefore, been fortunate in adding to the number of cooperative relationships that serve to test the value of our endeavors.—During the past year, our work has been devoted entirely to furthering the knowledge and improving the tools available to both military and civilian medical science. Under this broad aim a dual program has been carried out.—The Biological Laboratory has continued to serve military medicine under the terms of its contract with the War Department. It is not yet possible to elaborate on experiments conducted for the Chemical Warfare Service and the Army Air Forces. In a general way our concern has been in originating and testing apparatus for use in reducing the extent of illness among our soldiers, and in designing equipment for the treatment of certain types of military casualties. We have had the satisfaction of seeing some of our equipment put into experimental use at Truax Field, Wisconsin.—In our civilian program we have attempted to make available for clinical practice the result of experimental investigations on penicillin. Perhaps the most interesting aspect of the work has been the development of penicillin mists for inhalation. We know that many serious lung infections are caused by bacteria susceptible to the action of penicillin. It appeared to our colleague, Major H. A. Abramson, M. C., that the introduction of penicillin directly to the site of infection might give certain advantages over conventional methods of administering the drug. Clinical studies at the College of Physicians and Surgeons in New York City, and at St. Johns Hospital in Brooklyn, have confirmed the value of penicillin aerosols in the treatment of some kinds of chronic and acute pulmonary disease. Subsequent to publication of a paper on the method in *Science*, considerable interest was evidenced by the public press. As a result, the Biological Laboratory has received more than one hundred and fifty letters from the United States, Canada and Europe, expressing interest in the use of penicillin aerosols.—One of the clinicians most actively associated with our penicillin research has been Dr. E. J. Grace, Clinical Director of the Huntington Hospital and Director of the Grace Clinic in Brooklyn. In addition to performing a valuable survey of penicillin aerosols at St. Johns Hospital, Dr. Grace has been associated with us in originating a new method for the local administration of penicillin to infected wounds.—Need for the development of a modified technique was made imperative by recurrent failures of penicillin therapy in treating such chronic diseases as osteomyelitis. Recent studies by Dr. M. Demerec emphasized the need for attaining a therapeutically effective concentration of penicillin in immediate contact with all pathogenic bacteria in wounded or infected areas. Penicillin in effective levels must reach into the many interstices and crevices that cover the surface of a penetrating wound. As ordinarily used it may fail to accomplish its purpose.

Therefore we have used a highly concentrated solution combined with the chemical, sodium tetradecyl sulfate. Combination with the chemical lowers surface tension in the penicillin solution, making it flow readily into the minute crevices of infected muscle or bone. Those of us working in the Laboratory are gratified to learn from our clinical co-workers that individuals hospitalized almost continuously for many years, and unsuccessfully treated by the usual methods of administering penicillin, are now leading normal lives through the medium of the penicillin-sodium tetradecyl sulfate therapy. Efforts are being made to introduce the method to military hospitals, so that it may be used in the treatment of our wounded servicemen. If our hopes are realized we will feel that altogether this has been a most successful and rewarding year.

Delbruck, M., Vanderbilt University, Nashville, Tenn.—A brief stay at the Biological Laboratory was utilized to study the growth of the bacterial viruses (bacteriophages) T3, T4, T5, and T6 of Dr. Demerec's collection. These viruses, as well as T1, T2, and T7, can all grow on one bacterial host strain, B. T1, T2, and T7 have previously been studied extensively. T3, T4, T5, and T6 were added recently, and much remains to be learned concerning them. Demerec and Fano have described the plaque types formed by these viruses, and have made an extensive study of "cross-resistances"; that is, they have investigated whether mutants of strain B that are resistant to one of these viruses are also resistant to one or more of the other viruses. Such cross-resistance tests serve to subdivide the totality of viruses that are active on one host into subgroups, called cross-resistance groups. Two viruses belong to the same cross-resistance group if most or all mutants that are resistant to one of the two viruses are also resistant to the other one. Demerec and Fano had found that the seven viruses mentioned above can be classed in the following cross-resistance groups: T1, T5; T2; T6; T3, T4, T7. —These results are in accord with those of similar tests made by me at Vanderbilt University, except that my tests indicated a possible relation between T2 and T6. The same viruses can, however, be classified by another method; viz., by serological cross reactions. In this method two viruses are classed together if an anti-serum which inactivates one of the two viruses inactivates the other one also. I had made such tests and had found the following grouping: T1; T5; T2, T4, T6; T3, T7. —It has been asserted that these two methods of classifying bacterial viruses give essentially the same grouping, with the serological tests effecting perhaps a somewhat finer subdivision. It will be seen that our results do not support such a view. T4, for instance, is placed in entirely different groups by these two types of test. By cross-resistance tests it is classed with T3 and T7, which form large plaques; by serological tests it is classed with T2 and T6, which form small plaques, as does T4. It is rather important to learn more about the true meaning of these empirical methods of classification; and one way of pursuing this goal is to study each of the viruses by itself, to see whether they offer more criteria on which to base a judgment of their natural relationships.—The method of making one-step growth experiments was

used to determine the latent periods and the burst sizes of these viruses. For T4 and T5 experiments were also performed in which each bacterium was simultaneously infected with several virus particles of the same kind. In these multiple-infection experiments it was found that multiple infection in no case alters either the latent period of virus growth (the time interval between infection of the bacterium and lysis of the bacterium) nor the burst size (the average number of virus particles liberated from an infected bacterium when the bacterium is lysed). The same rule had previously been found to hold for T1, T2, T7, and for other bacterial viruses growing on other hosts. It seems to be the result of some general mechanism, and may be related to the phenomenon of virus interference.—The quantitative results may be summarized in the following table.

TABLE I

| | Latent period | Burst size | Adsorption in 5 min. | Plaque size |
|--------|---------------|------------|----------------------|-------------|
| [T1] | 13' | 200 | 50% | medium |
| [T5] | 40' | —300 | 15% | small |
| [T2] | 21' | 130 | 85% | small |
| [T6] | 25.5' | 200-300 | 80% | small |
| [T4] | 23.5' | —300 | 90% | small |
| [T3] | 16' | —300 | 50% | large |
| [T7] | 13' | —300 | 60% | large |

NOTE: Brackets on left indicate serological grouping; brackets on right indicate cross-resistance grouping.

It will be seen that the growth characteristics lead to a grouping similar to that indicated by serological tests. Plaque sizes, also, are uniform in each group. Cross-resistance grouping is strikingly different, particularly in the case of T4. It would be desirable to amplify these studies by electron-microscopic work and by experiments on interference between these viruses.

Dobzhansky, Th., Columbia University, New York, N. Y.—In cooperation with B. Spassky, I. Markreich, and G. Streisinger, I was working on the genetics of certain species of *Drosophila*. Approximately twenty mutants were induced, with the aid of X-ray treatments, in each of the two species *Drosophila prosaltans* and *Drosophila willistoni*. Some of these mutants resemble the well-known mutant types in *Drosophila melanogaster*, others are peculiar to the species concerned. The mutants obtained will permit rough genetic maps to be made of the

chromosomes of these species.—A series of experiments was made on sexual isolation between strains of *D. prosaltans*, *D. willistoni*, and *D. sturtevantii* of different geographic origin. The technique consisted in placing 10 females of each of the two strains to be studied and 10 males of one of these strains in a vial, keeping them as long as necessary to have approximately fifty per cent of all the females inseminated, and then dissecting the females and examining their sperm receptacles under a microscope. It was found that strains of *D. willistoni* in general interbreed at random, regardless of geographic origin, except that males from Guatemala as well as those from Brazil inseminate more Brazilian than Guatemalan females. In *D. prosaltans* there exists a "hierarchy" of sexual preferences, with females of more northern origin (Mexico) being inseminated in preference to those of more southern origin (southern Brazil), by northern as well as by southern males. Finally, in *D. sturtevantii* there exists a general preference for homogamic matings in all the geographic strains examined.

Lowenstein, Marta G., and Lowenstein, Otto, New York University Medical College, New York, N. Y.—Our work during the summer of 1944 dealt with the function of the pineal body. In our experiments a method developed by Otto Lowenstein was used to obtain graphic records of pupillary movements (pupillography) by means of moving pictures. Previous experiments had shown that photoreaction of the pupil is not limited to the reflex to light, but that the pupil reacts to darkness as well—both reflexes, the reflex to light and the reflex to darkness, occurring independently of each other and running over different nervous pathways. Evidence supporting this view is found in pathological cases where one of the two reflexes has been lost while the other continues to function—From one such pathological case, where tumor of the pineal body was present, we conceived the idea of comparing pupillary reflexes in animals having the pineal body and in those lacking it. Such comparisons seemed desirable because phylogeny and comparative anatomy suggested the possibility of a relationship between pineal body and optic areas.—Our experiments were made on rats, mice, and pigeons. There were three different series of experiments. (1) Pinealectomy: The pineal body of young rats was removed, and pupillary reactions were recorded before and after the operation. (2) Implantation and injection: (a) Fresh pineal bodies, removed from rats, were implanted into pigeons. (b) Pineal body extract (Difco Laboratories, Detroit), and Antuitrin S, were injected into pigeons subcutaneously. Pupillograms were taken before and after implantation or injection. (3) Series of animals (mice, pigeons, rats) were kept in light and darkness respectively. After a certain lapse of time (three to six weeks) the animals were sacrificed and the pineal body examined histologically.—At present, the following can be said about the results of these different series of experiments, which are being continued: (1) Implantation of substance of the pineal body results in an exaggerated function of the sympathetic part of the autonomic nervous system. This can be shown by a number of typical changes in the pupillographic picture.

(2) Injection of pineal body extracts induces the same phenomenon. (3) Injection of Antuitrin S provokes the opposite effect—diminishing of the sympathetic part, exaggeration of the parasympathetic part, of the autonomous nervous function. (4) Although our histological findings are at present based on a very small number of examinations, there is evidence of differences between the histological pictures of the pineal bodies of animals kept in darkness and of those kept in light. (It may be worth mentioning that similar findings have been reported recently with respect to the anterior lobe of the pituitary.)—These facts have to be considered as first preliminary findings, to be completed by further experiments. They may, however, be interpreted now to a certain extent.—A number of evidences favor the assumption that sex-maturing processes are related to the activity of the pineal body. There are, however, so many facts which cannot be correlated with this concept that its evidence has been considered “confused,” “contradictory” and “unproven.”—Since our experiments have shown that the pineal body affects the sympathetic nervous system, and since, on the other hand, urogenital functions depend on sympathetic innervation—since, furthermore, histological findings point towards a stimulation of pineal body activity by light and darkness respectively—we may assume that these different factors, particularly those that relate the activity of the pineal body to external conditions (light and darkness), may be of some help for a better understanding of those hitherto confusing and contradictory facts. That the activity of the pineal body may be related to the external factors of light and darkness also could be assumed from the relationship between pineal body (and, antagonistically to it, anterior lobe of the pituitary gland) and the melanophores of certain poikilothermic animals, which react to application of pineal body and anterior lobe substance, respectively, so promptly that they are used as tests for the presence or absence of these substances.

Mayr, Ernst, The American Museum of Natural History, New York 24, N. Y.—During a six-weeks stay at Cold Spring Harbor I continued my experiments on sexual isolation in *Drosophila*, concentrating on the environmental factors that influence the degree of isolation between *D. pseudoobscura* and *D. persimilis*. Conditioning, temperature, and the role of the wings were studied in particular. A report of this work, done jointly with Professor Dobzhansky, is now in press (Proceedings of the National Academy of Sciences). Experiments were also continued on the sexual isolation of hybrid females of the two above-mentioned species in comparison with the two parental species. I plan to complete these experiments in the near future.—Part of the time was devoted to the final editing of my “Birds of the Southwest Pacific.” Some work was also done in preparation of Bulletin No. 4 of the Committee on Common Problems of Genetics, Paleontology, and Systematics.

Meyer, Leo M., Kings County Hospital, Brooklyn, N. Y.—During the summer of 1944 experiments were completed on the effect of intramuscular injections of methyl acetamide and para-chloro-xyleneol on the peripheral blood and bone marrow of rats. Preliminary work during

1943 indicated a distinct rise in the total number of leukocytes, particularly the polymorphonuclear cells. Examination of the bone marrow did not disclose any evidence of hyperplasia of the myeloid elements, suggesting that the leukocytosis resulted from expulsion of these cells from storage depots, rather than any direct stimulation of the bone marrow. It was further noted that animals maintained on continued daily dosages began to show definite histological evidences of liver damage. A manuscript describing these experiments, with results and conclusions, is in the process of preparation for publication.—Part of the summer was also devoted to the preparation of an exhibit on "Acute Infectious Lymphocytosis," which was presented at the 1944 Graduate Fortnight at the New York Academy of Medicine.

Schultz, Jack, Lankenau Hospital Research Institute, Philadelphia, Pa.—The summer's work at the Biological Laboratory was largely a continuation of current work at the Lankenau Hospital Research Institute. The opportunity was also afforded of completing tests in an experiment on radiation effects on maize begun at the University of Missouri with Dr. L. J. Stadler. The generous cooperation of Dr. Barbara McClintock of the Department of Genetics made this possible.—One of the most acute problems in the analysis of the effects of irradiation on the chromosomes is presented by the difference between the X-ray and ultraviolet results. In both maize and *Drosophila*, it has been abundantly shown that the types of rearrangement produced by X-rays occur much less frequently in ultraviolet-treated material. Yet in this material there is a high rate of production of mutants. It has appeared that the ultraviolet treatment induces "single breaks," which do not recombine with other broken ends to produce rearrangements. The test carried out was to ascertain whether ultraviolet irradiation produces interruptions of linear order ("breaks") which can be restituted ("healed"). Ordinarily such changes are not detectable; but it has been shown in X-ray experiments that they are detectable in ring-shaped chromosomes. In these cases, it can be shown that dicentric rings, which are lost or changed at ensuing divisions, are formed in about half the cases following single breaks. In the experiments performed with a small ring in maize containing the A^B allele, the genetic consequences of ring loss could be detected. These experiments, carried out at the University of Missouri, showed a high rate of loss of the A locus in the ring, in both embryo and endosperm. This result shows that single breaks occur very frequently in the ultraviolet, and are followed by restitution, thus putting the ultraviolet effects more in line with those of X-rays. The seedling tests carried out during the summer show this to occur in both embryo and endosperm to about the same extent, a point of some consequence in the analysis of ultraviolet effects in maize.—Work was also continued on the function of heterochromatin in *Drosophila*. Here the two most convenient criteria of activity are the role of these regions in the variegation process, and their role in the maintenance of fertility in the male. An analysis of the existing data on X-autosome translocations in *Drosophila melanogaster* shows a previously un-

suspected relation between heterochromatin in X and in autosomes. The fertility of the male is maintained in rearrangements where both breaks are in heterochromatin. If, however, the breaks in both X and autosome are "euchromatic" the male carrying such a rearrangement is sterile. We have here a phenomenon that calls for a reinvestigation of the relation of heterochromatin to sex—a problem which had seemed definitely settled in the negative in *Drosophila*.—At the Lankenau Hospital, with the cooperation of the Medical Staff, it has been possible to obtain material of human testes, from the orchidectomy performed in therapy of carcinoma of the prostate. With this material, a technique has been developed for the study of human pachytent chromosomes, based on the procedures used in the study of the *Drosophila* salivary-gland chromosomes. Study of these preparations, with the help of Miss Patricia St. Lawrence, was continued throughout the summer, use being made also of the excellent photographic equipment available at the Department of Genetics laboratory.—Dr. Helen Redfield carried out a series of experiments dealing with the effects of position and dosage of the heterochromatin nucleolar regions upon interchromosomal relations of crossing over in *Drosophila melanogaster*. In these first experiments, definite interrelations were shown to exist, the most striking effects occurring in homozygotes in which the nucleolar region was transposed to the end of the chromosome.

Stern, Curt, University of Rochester, Rochester, N. Y.—Information on the action of genes has been obtained both by studies of the end products of the reaction network through which genes control phenotypes and by studies of some aspects of the immediate activity of genes. Since the chemical structure of genes, as well as of the cellular material with which the genes interact, is unknown, elucidation of the immediate action of genes has only a few tools at its disposal. One of these is the artificial change of position of genes within the chromosomes and the observation of the effect on the activity of the gene in its new position. Using the technique of producing position changes by irradiating *Drosophila melanogaster* with X-rays, which cause breakages and new types of union of broken chromosome ends, studies were restricted to a specific gene for interruption of the cubital wing vein (cubitus interruptus, *ci*). The work carried out at the Biological Laboratory dealt with two parts of the problems of genic action: (1) An analysis was made of nine different cases in which a break had occurred near the dominant allele ci^W . Flies containing the rearranged gene sequence were compared with controls in which ci^W had remained in its regular position. In five rearrangements the dominance of ci^W had been, in different degrees, intensified, as shown by the more extreme mean of vein interruption produced by the heterozygote $R\ ci^W/+$ ($R\ ci^W$ = rearranged ci^W). No position effect was observed in four cases of rearrangements. The differences in effect are probably due to the specific location of the different breaks. The results in regard to the increased dominance of some of the $R\ ci^W$ are in agreement with those obtained with rearrangements in which the

recessive allele c_i was involved ($R c_i$). (2) Limited, preliminary data have shown strange cases of interaction of rearrangements where an individual is heterozygous for both $R c_i$ and $R +$ (rearrangement in which a normal allele $+$ is involved). These data were based on experiments in which the $R +$ parents were of uncontrolled general genetic background. It seems desirable to repeat the work, on a larger scale, with stocks of more nearly isogenic nature. Accordingly, new rearrangements were produced in an isogenic stock containing the $+$ -allele typical of the Canton stock. Thirty different cases of $R +$ giving different degrees of position effect were found, and cultures of these are now available. They will be used in future work.

COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE
BIOLOGY

List of Published Volumes

- *Vol. I (1933) Surface Phenomena 239 pp.
 - Vol. II (1934) Growth 284 pp.
 - Vol. III (1935) Photochemical Reactions 359 pp.
 - Vol. IV (1936) Excitation 376 pp.
 - *Vol. V (1937) Internal Secretions 433 pp.
 - Vol. VI (1938) Protein Chemistry 395 pp.
 - Vol. VII (1939) Biological Oxidations 463 pp.
 - Vol. VIII (1940) Permeability and the Nature of Cell Membranes 285 pp.
 - Vol. IX (1941) Genes and Chromosomes 315 pp.
 - Vol. X. (1942) The Relation of Hormones to Development 160 pp.
- *Out of print

LABORATORY STAFF

Bryson, Vernon—Research biologist
Demerec, M.—Director
Dorsey, Henry—Laborer
Holmes, Joseph—Outside handyman
Klem, Dorothy V.—Secretary
Laskin, Sidney—Biophysicist
Potter, James S.—Investigator
Reddy, William—Laborer
Skinner, Elizabeth—Clerical assistant

SUMMER RESEARCH INVESTIGATORS

Anderson, Thomas—University of Pennsylvania Medical School,
Philadelphia, Pa.
Delbruck, Max—University of Tennessee, Nashville, Tenn.
Dobzhansky, Th.—Columbia University, New York, N. Y.
Gordon, Myron—New York Zoological Society, New York, N. Y.
Lowenstein, Marta—New York, N. Y.
Markreich, Irene—Columbia University, New York, N. Y.
Mayr, Ernst—American Museum of Natural History, New York, N. Y.
Meyer, Leo—Brooklyn, N. Y.
Mirsky, Alfred—The Rockefeller Institute, New York, N. Y.
Neel, James—University of Rochester, Rochester, N. Y.
St. Lawrence, Patricia—Lankenau Hospital Research Institute,
Philadelphia, Pa.
Schultz, Jack—Lankenau Hospital Research Institute, Philadelphia, Pa.
Spassky, B.—Columbia University, New York, N. Y.
Stern, Curt—University of Rochester, Rochester, N. Y.
Streisinger, George—Columbia University, New York, N. Y.
Zamenhof, S.—New York, N. Y.

REPORT OF THE SECRETARY

The 47th meeting of the Board of Directors was held at the Downtown Association in New York City on January 24, 1944. The Directors recorded with deep regret the death of William K. Vanderbilt, who had been for 20 years a member of the Board and a generous supporter of the work of the Association. Mr. R. C. Leffingwell and Secretary of War Henry L. Stimson were nominated and elected members emeriti of the Board of Directors; and Dr. M. Demerec was elected Director of the Laboratory for the current year. He presented a report of the work at the Laboratory during 1943, including the continuation of the war research program and the use of the Laboratory for regular research during the summer. He suggested that this year be used to formulate plans for the research program and for the physical development of the Laboratory, since the period immediately after the war may be an opportune time to purchase laboratory equipment and building materials from stores released by the Government. At the suggestion of the President, the report of the Director was referred to the Scientific Advisory Committee and the Buildings and Grounds Committee for assistance in furthering plans for future activities. The Treasurer's report was then presented and accepted; and it was voted that \$6000 of the reserve balance should be transferred to the Finance Committee for investment, to become available when needed for special purposes of the Laboratory. The Secretary reported that an appropriation of \$5000 made by the Carnegie Corporation of New York to the Carnegie Institution of Washington, toward support of a cooperative program with the Long Island Biological Association, had been turned over to the Treasurer of the Association and used to pay the note made to Mrs. Henry W. de Forest on account of the purchase of Airlie. The budget of the Laboratory for 1944 was presented by the Director, and was approved. Dr. Chambers referred to the possibility of the Laboratory's providing a place to live and work for properly qualified discharged soldiers. The matter was referred to Dr. Chambers and Dr. Demerec for further consideration.

A special meeting of the Executive Committee of the Board of Directors was held on February 28, 1944, following the death of Dr. Charles B. Davenport, Secretary of the Association, on February 18. A resolution proposed by Dr. Murphy and adopted by the Board, recorded the sense of irreparable loss felt by the Association at the death of this eminent biologist who had been closely associated with the Biological Laboratory for forty-six years. The President and Secretary were authorized to inaugurate the Charles Benedict Davenport Memorial Fund, to be established as an endowment for aiding scientists in the biological field. It was also decided that a bronze plaque in memory of Dr. Davenport should be placed on one of the Laboratory buildings, when bronze castings again become obtainable. Dr. B. P. Kaufmann, who had agreed to act as Secretary in Dr. Davenport's place until a permanent Secretary could be selected at the summer meeting, was accordingly elected Assistant Secretary. Dr. Harlow Shapley, Professor of Astronomy at

Harvard University, was unanimously elected a member of the Board of Directors.

An Executive Committee meeting was held on June 13, 1944, to discuss the problem arising from a claim made by the Town of Oyster Bay that the Sand Spit belongs to and should be assessed to the Town. After some discussion it was agreed that Mr. W. Shelby Coates should be asked to represent the Association in negotiation with the Town of Oyster Bay.

The 21st Annual Meeting of the Association was held on July 25, 1944, in Blackford Hall. The Assistant Secretary presented a statement of the operations of the Executive Committee since the January meeting, and the actions of the Committee were voted approved. A report of the work of the Laboratory was made by the Director, who also announced that contributions to the Charles Benedict Davenport Memorial Fund totaled \$4,059 to date. The following were elected to the Board of Directors, Class of 1948: W. H. Cole, Mrs. George S. Franklin, E. C. MacDowell, William B. Nichols, Roland L. Redmond, and B. H. Willier.

Following the Annual Meeting, the 48th meeting of the Board of Directors was held in the George Lane Nichols Memorial Laboratory. The Treasurer's Report was presented by Dr. Demerec, and was accepted. Dr. E. C. MacDowell was elected Secretary of the Association, to succeed the late Dr. C. B. Davenport. It was then moved and voted that the Executive Committee be composed of the following members: E. C. MacDowell, Robert Cushman Murphy, William B. Nichols, Arthur W. Page, John K. Roosevelt, and Harold C. Urey.

Berwind P. Kaufmann,
Assistant Secretary.

REPORT OF THE TREASURER

The Treasurer reports total income for the year of \$30,345.30 and disbursements of \$21,335.25.

The Women's Auxiliary Board, under the leadership of Mrs. George S. Franklin, President; Mrs. Van Santvoord Merle-Smith, Vice-President; Mrs. Alvin Devereux, Secretary; Mrs. Gordon Rentschler, Treasurer; Mrs. Percy H. Jennings, Chairman of the House Committee; and Mrs. John C. Hughes, Chairman of the Membership Committee, contributed \$1,616.97 to the work of the Laboratory and also made many valuable gifts of furnishings for the houses on the grounds.

The Wawepex Society continued its annual grant, this year of \$1,250 plus \$250.00 for the John D. Jones Scholarship and \$200.00 for Library expenses. Officers of the Wawepex Society are: Charles M. Bleecker, Governor; Jesse Knight, Scribe; and T. Bache Bleecker, Custodian. In addition to its annual financial support, the Wawepex Society leases certain lands and buildings to the Association, free of rent, and carries the insurance on these buildings.

Mr. William F. Dean audited the books for the year. The balance sheet and income-and-expense accounts of the Association follow herewith:

BALANCE SHEET — 1944

ASSETS

Current:

| | | |
|---------------------------|-----------|-----------|
| Cash in banks | 16,984.52 | |
| Accounts Receivable | 743.12 | |
| | | 17,727.64 |

Securities held by Bankers Trust Co.:

| | | |
|------------------------------------|-----------|-----------|
| U. S. Savings Bonds Series G | 14,000.00 | |
| Other Securities | 8,856.00 | |
| Bonds | 6,000.00 | |
| | | 28,856.00 |

Securities held by N. Y. Community Trust:

| | | |
|-------------------------------|--|----------|
| Walter B. James Bequest | | 5,000.00 |
|-------------------------------|--|----------|

Land:

| | | |
|-------------------------------|-----------|------------|
| Land Purchased | 69,630.52 | |
| Land on 50-year lease | 13,500.00 | |
| Henry W. de Forest Gift | 12,000.00 | |
| Land (improvement) | 2,898.01 | |
| Land (Airlie) | 5,000.00 | |
| | | 103,028.53 |

Buildings:

| | | |
|--|-----------|------------|
| Blackford Hall* | 19,000.00 | |
| Jones Laboratory* | 10,000.00 | |
| Davenport Laboratory | 8,500.00 | |
| George L. Nichols Memorial Laboratory | 13,700.00 | |
| Williams House | 11,300.00 | |
| Stewart Cottage | 3,000.00 | |
| Hooper House* | 13,200.00 | |
| Wawepex Laboratory* | 7,500.00 | |
| Osterhout Cottage* | 5,500.00 | |
| Dr. Walter B. James Laboratory | 13,500.00 | |
| Reginald G. Harris House | 8,500.00 | |
| Urey & Cole Cottages | 4,765.00 | |
| Henry W. de Forest Building | 15,000.00 | |
| Machine Shop and Garage | 2,000.00 | |
| Airlie | 5,000.00 | |
| | | 140,465.00 |

Equipment:

| | | |
|------------------|-----------|-----------|
| General | 38,577.27 | |
| Biophysics | 16,849.90 | |
| Physiology | 2,513.15 | |
| | | 57,940.32 |

353,017.49

* Situated on property on 50 years' lease
from Wawepex Society

LIABILITIES

Current:

| | | |
|--|----------|-----------|
| Accounts Payable | 905.87 | |
| War Research Project | 4,432.45 | |
| Library Fund | 172.70 | |
| Rockefeller Symposia Fund Interest | 600.00 | |
| Charles B. Davenport Memorial Fund | 4,299.75 | |
| | | 10,410.77 |

Special Funds:

| | | |
|-------------------------------------|-----------|-----------|
| Blackford Memorial Fund | 5,000.00 | |
| Temple Prime Scholarship Fund | 2,500.00 | |
| Dorothy Frances Rice Fund | 2,000.00 | |
| Dr. William J. Matheson Fund | 20,000.00 | |
| Rockefeller Symposia Fund | 12,000.00 | |
| | | 41,500.00 |

Special Fund—in trust:

| | | |
|--------------------------------|----------|--|
| Dr. Walter B. James Fund | 5,000.00 | |
|--------------------------------|----------|--|

Balance:

| | | |
|--|------------|------------|
| Long Island Biological Association | 152,950.32 | |
| Value of Leasehold—Wawepex Society | 39,153.74 | |
| January 1, 1944 | 99,999.54 | |
| Gain in Capital—Decemebr 31, 1944 | 4,003.12 | |
| | | 296,106.72 |
| | | 353,017.49 |

Income and Outgo — Year Ended December 31, 1944

| | TOTAL | | NET | |
|--------------------------------------|-----------|----------|-----------|----------|
| | Received | Paid | Received | Paid |
| Balance forward from 1943: | | | | |
| Cash in Banks | 15,293.70 | | | |
| Payables and Receivables | 1,059.06 | 2,541.04 | | |
| | 16,352.76 | 2,541.04 | 13,811.72 | |
| Reserve fund invested in bonds | | | | 6,000.00 |
| | | | 7,811.72 | |
| Deduct: Special funds | | | 4,747.97 | |
| | | | 3,063.75 | |
| Current Accounts: | | | | |
| Dues and Contributions | 2,578.00 | | 2,578.00 | |
| Women's Auxiliary | 1,616.97 | | 1,616.97 | |
| Wawepex Society | 1,250.00 | | 1,250.00 | |
| W. B. James Bequest | 179.45 | | 179.45 | |
| W. J. Matheson Bequest | 375.00 | | 375.00 | |
| Research | 1,980.00 | 52.42 | 1,927.58 | |
| Sale of Books | 1,280.72 | 103.87 | 1,176.85 | |
| J. D. Jones Scholarship | 250.00 | 250.00 | | |
| D. F. Rice Scholarship | 75.00 | 75.00 | | |
| Temple Prime Scholarship | 75.00 | 75.00 | | |
| Summer Course | 233.00 | 203.00 | 28.00 | |
| Insurance | 143.97 | 180.62 | | 36.65 |
| Residences and Dormitories: | | | | |
| R. G. Harris House | 723.55 | 1,275.09 | | 551.54 |
| Hooper House | 738.79 | 865.00 | | 126.21 |
| Williams House | 745.57 | 658.38 | 87.19 | |
| Osterhout Cottage | 480.00 | 50.00 | 430.00 | |
| Urey Cottage | 450.00 | | 450.00 | |
| Cole Cottage | 205.00 | 221.70 | | 16.70 |
| Stewart Cottage | 568.35 | 542.56 | 25.79 | |
| H. de Forest House | 663.50 | 110.21 | 553.29 | |
| "Airslic" | 600.00 | 342.75 | 257.25 | |

| | | | | |
|--|-----------|-----------|-----------|-----------|
| Allocated to D. F. Rice and T. Prime Scholarships | | 150.00 | | 150.00 |
| Lab. Buildings and Grounds | 235.91 | 3,918.18 | | 3,682.27 |
| de Forest Property Taxes | | 372.27 | | 372.27 |
| General Expenses: | | | | |
| Administration Expenses | | 220.35 | | 220.35 |
| Administration Salaries | | 1,220.00 | | 1,220.00 |
| Telephone and Stamps | | 121.00 | | 121.00 |
| Stationery and Printing | | 413.27 | | 413.27 |
| Capital and Special Accounts: | | | | |
| Library | 200.00 | 205.00 | | 5.00 |
| Symposia Fund Interest | 300.00 | | 300.00 | |
| War Project | 10,052.86 | 9,640.68 | 412.18 | |
| C. B. Davenport Memorial Fund (\$600 in Bonds) | 4,299.75 | | 4,299.75 | |
| Payables and Receivables | 44.91 | 66.90 | | 21.99 |
| | | <hr/> | <hr/> | <hr/> |
| | 30,345.30 | 21,335.25 | 15,947.30 | 6,937.25 |
| Deduct—Payments | | | 6,937.25 | |
| | | | <hr/> | |
| Excess Receipts over Payments | | | 9,010.05 | |
| Add—Balance of 1943 | | | 7,811.72 | |
| | | | <hr/> | |
| Balance December 31, 1944 | 16,984.52 | | | |
| Payables and Receivables | 743.12 | 905.87 | | |
| | | <hr/> | | |
| | 17,727.64 | 905.87 | 16,821.77 | |
| Deduct—Special Receivables shown above | | | 5,011.93 | |
| | | | <hr/> | |
| Less Special Funds 1943 | | | | 11,809.84 |
| | | | | 4,747.97 |
| | | | | <hr/> |
| | | | | 7,061.87 |

Net Balance

Special Accounts: War Project \$4,432.45; Reserve Fund (invested) \$6,000; Symposium \$12,000 (invested) + \$600; Library \$177.70; Davenport Memorial \$4,299.75 + \$600 (bonds).

SPECIAL FUNDS

TEMPLE PRIME SCHOLARSHIP FUND

Donor: Cornelia Prime. Original Principal, \$2,500. (1913)

"In memory of my brother, Temple Prime, the entire annual income to be expended each year for the payment of the tuition and other expenses of a male, or female, student in biology, who is working at the Laboratory at Cold Spring Harbor, New York, during that year."

| | |
|--|---------|
| Allocated, 1944 | \$75.00 |
| Scholarship, support of research | 75.00 |

BLACKFORD MEMORIAL FUND

Bequest of Frances L. Blackford. Principal, \$5,000. (1924)

". . . to be used in the maintenance of the Blackford Memorial at Cold Spring Harbor, Long Island, as the trustees may deem to be for the best interest of said Memorial."

No income, 1944

DOROTHY FRANCES RICE FUND

Donor: Oran W. Rice. Original Principal, \$2,000. (1926)

Income to be applied as follows: (1) one-sixth to be added annually to principal of fund, (2) remaining five-sixths to be paid over each year to a woman student, preference of selection being given to students working in the botanical sciences and particularly worthy of such recognition.

| | |
|--|---------|
| Allocated, 1944 | \$75.00 |
| Scholarship, support of research | 75.00 |

DR. WALTER B. JAMES FUND

Bequest, in trust, of Dr. Walter B. James. Principal, \$5,000. (1927)

"I give and bequeath Five Thousand Dollars (\$5,000) to the Equitable Trust Company, in trust. . . I desire the net income thereof to be devoted to the support of Long Island Biological Association of Cold Spring Harbor, Long Island."

Invested by Trustee, Equitable Trust Company, New York.

| | |
|-------------------------------------|----------|
| Received, 1944 | \$179.45 |
| Transferred to Income Account | 179.45 |

DR. WALTER J. MATHESON FUND

Bequest of Dr. William J. Matheson. Bequest, \$20,000.

Cost of securities, \$20,116.18. (1931)

"I give and bequeath to Biological Laboratory, of Cold Spring Harbor, Long Island, for its endowment fund, the sum of Twenty Thousand Dollars."

| | |
|-------------------------------------|----------|
| Interest, 1944 | \$375.00 |
| Transferred to Income Account | 375.00 |

Marshall Field, Treasurer

William F. Dean, Assistant Treasurer and Auditor

