

LONG ISLAND BIOLOGICAL ASSOCIATION

ANNUAL REPORT  
OF  
THE BIOLOGICAL LABORATORY

COLD SPRING HARBOR  
LONG ISLAND, NEW YORK

1928

LONG ISLAND BIOLOGICAL ASSOCIATION  
INCORPORATED 1924

ANNUAL REPORT  
OF  
THE BIOLOGICAL LABORATORY  
FOUNDED 1890

THIRTY-NINTH YEAR  
1928



THE GEORGE LANE NICHOLS MEMORIAL RESEARCH LABORATORY

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WE record, with regret, the deaths of the first Director of the Laboratory, Doctor Bashford Dean, and of a Patron of the Association, Mr. William H. Nichols, Jr. The following resolution was adopted and sent to Mrs. Dean on December 8, 1928.

"The Executive Committee of the Long Island Biological Association have learned, with deep regret, of the death of Dr. Bashford Dean yesterday. Dr. Dean was the first director of the Biological Laboratory and it was due directly to his interest that the Laboratory received a firm foundation, through the gift of John D. Jones of a building and lands. The noteworthy development of the Laboratory is largely due to the vigor of the germ that Dean planted and nourished. So long as the Laboratory persists his memory will be cherished by it.

"The Executive Committee of the Long Island Biological Association desire to express to you their sympathy in your bereavement."

The following resolution was adopted and sent to Mrs. Nichols. "The Long Island Biological Association has learned with deep regret of the death of its patron, William H. Nichols, Jr., on May 26th last. It records its indebtedness to Mr. Nichols for his interest in the work of the Association and the generous contributions toward it. It desires that this resolution should be spread upon its minutes and a copy transmitted to Mrs. Nichols."

## REPORT OF THE DIRECTOR

*To the officers and members of the Long Island Biological Association:*

Gentlemen:

I have the honor to submit the following report for the year 1928.

In accordance with the policy adopted by the Board of Directors of the Long Island Biological Association this year the Biological Laboratory

(1) reduced the number of students and raised the requirements for attendance

(2) increased the research staff and research activities of the Laboratory

(3) employed Doctor Hugo Fricke for research in biophysics as the first member of its permanent resident research staff for all year round work, and

(4) created a special scientific advisory committee composed of Doctor W. J. V. Osterhout, Chairman, Doctor W. J. Crozier, Doctor J. H. Bodine, and Doctor Reginald G. Harris.

### **Instruction as a Basis of Research**

The Biological Laboratory of the Long Island Biological Association is committed to the advancement of biological research in all its fundamental aspects at all seasons of the year. The instruction offered in the summer is designed to train persons who expect to carry on research or to stimulate and instruct others in so doing. The Laboratory will offer, next summer, places to approximately forty selected students of this character.

### **Increase in Research**

As a result of the new policy and of increase in space, equipment, and funds, the number of persons engaged in research at the Laboratory was twenty-eight this year as compared with nineteen in the year 1927.

We have extended our work until it includes research in medical zoology and other departments of experimental medicine. This inclusion, we believe, while making the Laboratory more catholic in extent, and capable of cooperating with a wider range of departments of universities and medical schools, brings in a group of medical investigators, as well as pure biologists, and gives to the Laboratory an attitude which seems to be highly desirable. That

attitude results from juxtaposition of experimental biology and experimental medicine, with a consequent mutual exchange of viewpoints and methods of approach of what we have been pleased to call "pure biology" and "applied biology". It is believed that such intercourse is of value to both groups, and provides a useful liaison between workers and methods that are, perhaps, too widely separated. Such liaison, we believe, will, from the broad view-point of advance in biology and medicine, be instrumental in bringing about a decrease in duplication of effort and research, with a consequent increase in productivity per unit time and per unit cost.

### **Research in Biophysics**

The work of the Biological Laboratory has been further extended to include research in biophysics. This is concerned with a speedy and fundamental advance in theoretical and in applied biology by means of the application of very valuable and far-reaching advances in physics. Advances in physics are being applied to industry as fast as they become available. Indeed, industry is sponsoring them, in not a few cases, because of their apparent value to it. It may be safely assumed that their value to biology and medicine will be equally great.

BIOPHYSICS made its debut at the Biological Laboratory with the acceptance by Doctor W. J. V. Osterhout, of the Rockefeller Institute for Medical Research, of an appointment to our honorary staff of research. A botanist, physiologist, and, more recently, a biophysicist, Doctor Osterhout has extended the knowledge of spindle formation and fertilization in plants; antagonism; permeability; electrical conductivity; respiration; photosynthesis; and bio-electric phenomena.

Doctor Osterhout found the potential advantages for carrying on biophysical research at the Laboratory to be so great that he strongly urged the desirability of doing so on a relatively large scale. This suggestion eventually led to the appointment of Doctor Hugo Fricke, a specialist in X-rays, and in electric resistance and capacity of biological systems. A Dane by birth, Doctor Fricke received his early training at the University of Copenhagen, where he took a doctorate in 1916, two years later receiving a similar degree from the University of Lund. Following this he came to America where he was research assistant at Harvard University during the year 1919 to 1920. He has been the director of the department of biophysics of the Cleveland Clinic Foundation since 1921, his work during that time leading to the publication of some twenty

technical papers and reports. His work has been technical and fundamental in nature, but from it, already, have arisen results of immediate and important practical application. Among these results are a means of differentiating between benign and malignant tumors, by their electric capacities; a method of determining the fat-content of milk and cream by measurement of their electric conductivity; and an X-ray dosimeter which, I understand, is probably the most extensively used clinical dosimeter in this country.

Doctor Fricke comes to the Laboratory this year to press forward research upon the fundamental action of X-rays. At the same time the work dealing with the electrical capacity, conductivity, and polarizability of cells at different frequencies, particularly at high frequencies, will be continued, the marine forms which are available at our Laboratory providing a very valuable material for this work.

### **Protozoology**

Doctor Asa A. Schaeffer, Professor of Zoology of the University of Kansas, and a member of our summer staff in research, has long made use of the Laboratory during the summer, for the furtherance of his studies on the taxonomy, anatomy, and physiology of protozoa, and of his investigations of spiral movements in man. All of these researches have been productive of highly important findings, in amassing the data for which Professor Schaeffer has, perhaps, used the facilities of The Biological Laboratory more than those of any other single institution. His "Taxonomy of the Amebas", an extensive monograph published by the Carnegie Institution of Washington, and his treatise upon "Spiral Movements in Man" published in the Journal of Morphology, Vol. 45, No. 1, Mar. 5, 1928, as well as numerous smaller papers, published recently, contain records of his work.

This last summer Doctor Schaeffer was with us again, advancing his work on the nature of the mechanism producing spiral movements in organisms.

In his report, which can be found on page 28, there is evident not only the high quality of the work and the ability of the worker to unearth and recognize fundamental facts, but incidentally there appear abundant answers to the frequently asked questions of "What is the practical significance of work upon non-disease producing protozoa, on molluscs which are not for food, on salamanders, on insects which have no economic importance, and upon a host of other unimpressive animals?" "Does the man who is engaged in research dealing with these animals have any practical end in view?"

In the present instance the patency and validity of the answers are apparent. The research is an attempt to understand a type of movement which seems to be characteristic of many, if not of all, forms of moving life, hence a basic principle of protoplasmic movement. The practical value of success in this research lies, in part, in the fact that "the general differentiating process and at least certain phases of nerve transmission depend on protoplasmic movement". Additional information on the mechanism of nerve transmission would be unquestionably useful, while an understanding of the factors involved in differentiation would line up, in practical importance, with the discovery of the physical basis of inheritance.

It is my belief that immediate, or eventual, applicable significance is present in all biological research which is well-conceived and carefully carried on. The reason that the truth of this assertion is not more generally recognized is that it frequently happens that the more fundamental the research, the less easily apparent is its application.

### **Chemistry Applied to Biology and Medicine**

The accepted value of applying knowledge of chemistry to biological research, whenever possible, is an indication of the enormous advances which have been made in the last few years toward accurate, quantitative, controlled observation as a method of accumulating biological data. The application of chemistry to biology is to be found in nearly every branch of biological research, and much of the work of the Laboratory this year could be placed under this modern heading.

For example, Doctor I. S. Kleiner, Professor of Physiology at the New York Homeopathic Medical College, consulting chemist at the Flower Memorial Hospital, and a recent appointee to our summer-staff in research, was studying the nature of the sugar in the blood in diabetes.\*

Doctor William Salant, Professor of Pharmacology of the University of Georgia Medical School, and a member of our summer-staff in research, worked on the action of various chemicals upon living systems and upon drugs, particularly the effect of mercury on the autonomic nervous system, and on the smooth muscles, and the effect of calcium on the toxicity of drugs, especially carbon tetrachloride.\*

A report of the work which Doctor Salant carried on at the Laboratory during the summer of 1927 will be found under the title,

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\*See appended report of research-workers.

"Circulatory Reactions to Ergotamine and Effect Upon Them Produced by Adrenalectomy and the Blood pH," in the Proceedings of the Society for Experimental Biology and Medicine, 1928, Vol. XXV, page 361.

Mr. Keeve Brodman of Cornell University Medical School has assisted Doctor Salant in his work the last two summers, and is a co-author of the paper just cited. Mrs. Brodman assisted with the work this year.

### Physiology

A series of fundamental researches in physiology, concerned with the basic action of various chemicals upon living protoplasm were conducted by Doctor J. H. Bodine of the University of Pennsylvania, a member of our summer-staff.

Working with Doctor Bodine, this year, were Miss Elizabeth Yagle, Mr. Melvin W. Thorner, Mr. Charles H. Hodge Jr., and Mr. John W. Huggins, all graduate students in the University of Pennsylvania.

Doctor Bodine's personal researches included two problems: 1. "The fundamental action of ions on the egg of *Fundulus*," and 2. "The physico-chemical nature of the chorion and the site of salt antagonism on the egg."

Miss Yagle continued her research upon "Factors influencing the rates of water-exchange in *Fundulus* egg".

Mr. Thorner investigated the "Rates of diffusion of ions into, and out of, *Fundulus* egg".

Mr. Hodge made "Studies upon metabolism and other physiological functions in fireflies".

Mr. Huggins carried on research upon the metamorphosis of *Drosophila*, the fruit-fly, the study of which has contributed so vastly to our information of the laws of inheritance.

The results of these studies are not yet available in print, though some of them will be shortly. In the meantime, a second paper, which appeared subsequent to our report for 1927, upon the work which Doctor Bodine carried on at the Laboratory that summer, is entitled, "Action of Salts on *Fundulus* Egg. 1. The Action of Na, K, and Ca Chlorides upon the Egg of *Fundulus*." This may be found in the *Biological Bulletin*, Vol. LIV. No. 5, May 1928, page 396.

### Endocrinology

Research upon the physiology and function of the glands of internal secretion was continued by Doctor Edward L. Corey of Yale

University, recently appointed to New York University. Doctor Corey joined our staff, taking charge of the course in Endocrinology, in place of Doctor W. W. Swingle who had requested a year's leave of absence. (Doctor Swingle will be with us again during the summer of 1929.) Doctor Corey's research was concerned with "the discovery of the earliest reaction of the mammal (rat) to the hormonal secretions of the pars anterior of the pituitary gland".\*

Professor Malcolm Little of New York University was engaged in experiments upon the removal and grafting of internal glandular tissues, namely the pineal gland in one type of work, and testicular grafts in another.\*

### **Pathogenic Protozoology**

Doctor Justin Andrews, of the School of Hygiene and Public Health at The Johns Hopkins University, was appointed to our staff in research and in charge of the course in Surgical Methods in Experimental Biology.

Doctor Andrews was engaged in ascertaining "the biological and biochemical changes in host and parasite which eventuate in the death of the host" in a pathogenic trypanosome infection occurring in horses.\*

Mr. Eugene Schumaker, of the School of Hygiene and Public Health of The Johns Hopkins University, was appointed to take charge of chemical supplies at the Laboratory. In addition to the work which he did in collaboration with Doctor Andrews (described in the preceding paragraph) Mr. Schumaker was engaged in "trying to perfect, or at least make applicable, a technique which will enable me to examine portions of the alimentary tract of guinea pigs by means of fistulas, this technique to be used in cross infection experiments".

The work of Dr. Elizabeth P. Sanders during the summer of 1926 was published this year in the *Journal of Parasitology*, March, 1928, volume XIV, page 188, under the title "Observations and Experiments on the Haemogregarines of Certain Amphibia".

### **Histology**

Doctor S. I. Kornhauser of the Medical School of the University of Louisville was appointed to our staff in Field Zoology and in research. Doctor Kornhauser is known for his very careful and important histological studies. His work this summer was con-

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\*See appended report of research-workers.



cerned with "the Differentiation and Growth of the Ovum of the Sea-Side Earwig, *Anisolabis maritima* Bon".\*

Mr. Hwei-Ling Lu, John D. Jones Fellow from Columbia University, continued very interesting preliminary work upon an important problem, upon which he reports, "My work is a study of the effect of X-rays on the protoplasm as manifested by any change of structure or of behavior in the cytoplasmic bodies. The work that I am doing now is a preliminary examination of those cytoplasmic bodies in their normal (not radiated) conditions and also a trying out of the technique involved in this study. Wheat seeds are used."

Doctor Christiana Smith of Mount Holyoke College, with the assistance of Miss Margaret Harland of the same college, carried on research on blood-rhythms in persons.\* These workers served as their own experimental material.

Doctor George B. Jenkins of the Medical School of George Washington University amassed material for a complete study of the normal development of *Fundulus*.\*

### Botany

Doctor H. S. Conard of Grinnell continued his instruction and research in Plant Ecology, making important contributions to the knowledge of the relationship of vegetation and environment in this region.\*

Doctor Conard reports that the re-survey of the belt on the salt marsh will form a joint paper by him and one of the students in his course at the Laboratory, Miss Gladys Galligar of The James Millikin University.

Another student, Miss Katrina Haines, aided in collecting data for a third report on the "Denuded Area".

Professor A. W. Blizzard of Coker College, carried on a survey of the ecology of the High Hill region. He will report his results at the next meeting of the American Association for the Advancement of Science.

Mr. Frederick K. Sparrow, Jr., of Harvard University, assisted by Miss Myrtle Carroll, a graduate of Adelphi College, continued his studies on fungi.\*

### Preparation of Books

"Biology of Vertebrates," a textbook by Professor H. E. Walter, of Brown University, and in charge of our course in Field Zoology,

\*See appended report of research-workers.

has been published by Macmillian. It has immediately met with the very favorable reception, customary with Doctor Walter's textbooks. Much of the work leading to, and in the preparation of, this valuable volume was done at the Laboratory.

Professor H. S. Pratt of Haverford College, for many years in charge of the course in Comparative Anatomy at the Laboratory, author of several important textbooks, many of the data for which were amassed here, returned as a visitor this year. He spent the summer in revising his "Manual of the Common Invertebrate Animals".

Professor H. M. Parshley, of Smith College, and a member of our staff in Field Zoology, conducted his book "Science and Good Behavior" through the press. He reports that it "deals in good part with animal behavior, including observations made at Cold Spring Harbor". This interesting treatise appeared late this year (1928), published by Bobbs-Merrill.

Professor Malcolm E. Little's "A Laboratory Manual for Comparative Anatomy" has very recently been published by Macmillian.

Other biologists connected with the Laboratory were engaged, at times, in preparing books which have not yet proceeded far enough to be included in this report.

### **Advantages of All Year Round Policy**

The decision to carry on research throughout the year seems to have many advantages, the most striking of which is, probably, economy. It permits us to avoid the uneconomical procedure of permitting the plant and equipment of the Laboratory to lie idle nine months of the year. The additional cost involved in carrying on research at all seasons should be proportionately less than the cost involved when work is carried on during the summer only.

Fortunately, our situation is an advantage, rather than a disadvantage, in respect to this plan. Not only do we have available a goodly supply of marine as well as other experimental material at our doors, but our rural location carries with it a lower cost of living than maintains in the more thickly settled metropolitan area, thereby permitting our staff members and other workers to require smaller salaries than those needed in New York, or other large cities. It is further true that many biologists prefer to live and work in the country, provided they are not too far from a large city. In this respect we are ideally situated, and shall probably find it relatively easy to maintain an unusually competent staff of in-

vestigators. In addition to this staff we shall doubtless extend to biologists enjoying sabbatical leave the privilege of carrying on research in our Laboratory, making it financially possible for them to do so. Indeed, we have already made arrangements to do precisely this in the case of Doctor Felix Bernstein, Director of the Institute of Mathematical Statistics of the University of Göttingen.

The carrying on of research throughout the year has been made possible by the George Lane Nichols Memorial.

### **The George Lane Nichols Memorial**

The offer (announced in the Annual Report for 1927) of Mr. and Mrs. Acosta Nichols to contribute \$12,000 in memory of their son, George Lane, a very lovable and intelligent boy, particularly interested in biology, permitted us to take immediate steps toward the erection of a memorial laboratory. This laboratory, which is well arranged, attractive, and very useful for scientific research, was ready for occupancy in June. In the meantime, Mr. and Mrs. Nichols had contributed \$8,000 additional toward its construction, and Mrs. Nichols had further spent considerable thought, time, and money in foundation planting.

This summer, every room in this laboratory was used for the purpose for which it was constructed, save an unfinished room. As we write this report that room is being equipped as a machine shop for use in biophysical work. More than half of the building is already in continuous use throughout the year, and the prospects are bright that before long the entire building will be.

Thus in the first half year after its completion this splendid memorial is admirably meeting the purposes for which it was given. In seeing the research progress within it, it is pleasant to think of the boy whose interests and ideals it carries on.

In choosing to erect, at the Biological Laboratory, a memorial to George Lane Nichols, Mr. and Mrs. Nichols acted wholly in keeping with his tastes, inclinations and affections, at the same time promoting a work in which he, very probably, would have continued to be actively interested, if not eventually a participant himself, as he seemed to have inherited many of the tastes, and much of the mental attitude of his great-uncle, Professor Franklin W. Hopper, who was one of the founders of the Biological Laboratory, and who, as Director of the Brooklyn Institute of Arts and Sciences, took a very important part in the work of the Laboratory.

## Instruction

There have been no courses added to, or eliminated from, the curriculum this year, and comparatively few changes were made in the staff of instructors. In Field Zoology, Doctor H. E. Walter was finally prevailed upon to take charge of the course for this summer. His action in thus responding for the last two summers, after retiring from summer teaching, indicates his personal friendship and loyalty to the Laboratory. Neither can be overestimated, nor his help adequately described.

Doctor Parshley, who had asked to be released for the summer of 1927 so that he might teach at the University of Chicago, returned to the staff this summer.

Doctor S. I. Kornhauser, and Doctor Roy K. Waggener, former valued members of the staff, returned after absences of five years and one year, respectively. Professor Sykes continued to give his whole-hearted services to the work of the course.

The personnel of the staff of the courses in Physiology and in Botany was unchanged.

In Endocrinology, Professor Swingle asked for a year's leave of absence. We were fortunate in being able to obtain Doctor E. L. Corey, then of Yale University.

Doctor J. S. Nicholas, of Yale University, resigned from the instructorship of the course in Surgical Methods in Experimental Biology in order to devote all of his time, during the summer, to research. The course was very ably conducted by Doctor Justin Andrews of Johns Hopkins University School of Hygiene and Public Health.

An important change in instruction resulted from a formal change in policy, which our staff was admirably fitted to carry into effect. This change in policy brought about a marked reduction in the number of students admitted in courses, there being only about forty students this year. At the same time the applications for admission were very carefully scrutinized, with the result, we believe, that our courses served a better group of students this year than ever before. More than half of those registered in General Physiology were engaged in research. All of those enrolled in Botany were introduced to individual problems in experimental ecology. The class in Surgical Methods in Experimental Biology were expected to, and did, engage in research. The course in Field Zoology was very much reduced in size by the insistence upon admitting only exceptionally well-qualified students who were deeply interested

in the work. Nearly all of the members of this class lived up to expectations. Indeed I look back upon the last summer as the most satisfactory, from the viewpoint of instruction, of any summer since I became connected with the Laboratory. It is to be expected that, in the further pursuance of our new policy, even further improvement will be brought about.

### Evening Lectures

The public evening lectures, delivered at the Laboratory this year, probably surpassed, in interest and extent, those of any previous year. With the addition of the meetings of the Journal Club of the Department of Genetics of the Carnegie Institution of Washington, in which members of the Laboratory took part, the opportunities for hearing resumés of personal research were excellent this summer.

The following is a list of the evening lectures given in Blackford Hall, at the Biological Laboratory, and indicates the importance of the lectures, and the unusually well-qualified group of lecturers.

Doctor Justin Andrews, School of Hygiene and Public Health, Johns Hopkins University—"Parasitology of the Past and Present."

Doctor J. H. Bodine, University of Pennsylvania—"Metabolism of an Invertebrate."

Doctor C. T. Brues, Bussey Institute, Harvard University—"The Fauna of Hot Springs."

Doctor H. J. Conn, New York State Agricultural Experiment Station—"Work of the Committee on the Standardization of Biological Stains."

Doctor H. S. Conard, Grinnell College—"Flora of Long Island Since the Glacial Period."

Doctor E. L. Corey, Yale University—"The Adrenal Problem."

Doctor W. J. Crozier, Harvard University—"Photic Adaptation."

Doctor Charles B. Davenport, Carnegie Institution of Washington, Department of Genetics—"Race Crossing in Jamaica."

Doctor S. R. Detwiler, College of Physicians and Surgeons, Columbia University—"Experiments upon the Growth of Nerves in the Embryo."

Doctor I. S. Kleiner, New York Homeopathic Medical College and Flower Hospital—"Blood Sugar and Diabetes."

Doctor S. I. Kornhauser, University of Louisville, Medical School—"A True Human Hermaphrodite."

Doctor Robert Cushman Murphy, American Museum of Natural History—"Mediterranean Cruise of 1926."

Doctor Oscar Riddle, Carnegie Institution of Washington, Department of Genetics—"Internal Secretions in Evolution and Reproduction."

Doctor William Salant, University of Georgia, Medical School—"Factors Modifying Reactions to Drugs."

Doctor A. A. Schaeffer, University of Kansas—"Spiral Movement in Man and Other Organisms."

Doctor Christianna Smith, Mount Holyoke College—"Leucocytic Rhythms."

Doctor Frank Thone, Science Service—"Supersonic Waves and Their Influence on Plants."

### **Nature Study for Children**

We were again fortunate in obtaining Miss Grace M. Lowe to take charge of the classes in Nature Study. Advanced classes for the older children were established, and the work apparently progressed in a very satisfactory manner. This, however, would have been impossible without the assistance of Mrs. Rodman Gilder, who organized the classes, and gave very valuable suggestions as to their conduct. In this work Mrs. Gilder has, for several years, taken an interest, and given her splendid efforts to an extent for which we cannot make too much acknowledgment.

### **Women's Auxiliary**

The Women's Auxiliary took an active and very important part in the work of the Association this year. At its third annual meeting, held at Blackford Hall, July 19th, the Director, with the approval of Mrs. Walter Jennings, then President, suggested that the members of the Auxiliary undertake to raise \$5,000 to help make possible the carrying on of research throughout the year. Several possibilities of productive research, including that upon the fundamental action of X-rays, were presented. Mrs. Jennings very enthusiastically supported the suggestion, particularly in respect to the work on X-rays. Indeed the sentiment of the meeting was unanimously in favor of adopting the suggestion. It was thought that more women, than were present at the meeting, should have an opportunity to vote upon the proposal, and so Mrs. Jennings invited the members of the Auxiliary to meet at her home the following week.

Meanwhile, the new officers of the Auxiliary were elected as follows: President, Mrs. Rodman Gilder; Vice-President, Mrs. Russell Leffingwell; Treasurer, Mrs. George Nichols; Secretary, Mrs. Acosta Nichols; Chairman of the Finance Committee, Mrs. Walter Jennings, and Chairman of the House Committee, Mrs. John H. J. Stewart.

At the meeting of July 27th at Mrs. Jennings' home, the proposal, being strongly supported by Mrs. Jennings, Mrs. Gilder, and others, was discussed in detail and met with such wide-spread approval that the vote of acceptance was unanimous. Then and there various members stated that they would contribute definite amounts each year for three years, and considerable further impetus was given when Mrs. T. S. Williams stated that Colonel Williams had offered to contribute \$1,000 per year for three years, if the women would raise \$4,000. Mrs. Jennings and her Finance Committee, composed of Miss Boardman and Mrs. Leffingwell, immediately became active, and, in a relatively short time, the \$4,000 was pledged. But their activity did not cease. It became apparent that considerably more than \$5,000 would be needed to carry on the work in X-rays, and the women were ready to help to even a larger extent than they had promised. A contribution of \$1,000 was received "In loving memory of George Lane Nichols". This advanced the total of the amount which the women had raised to over \$6,000.

The thanks of the Association are due to all of the officers and members of the Women's Auxiliary for the success of this splendid undertaking, and particularly to Mrs. Walter Jennings, about whom, as Chairman of the Finance Committee, the work revolved.

The achievement of the women will stand out, in the history of the Laboratory, as a very important phase of its development. Its value and significance are much more than the raising of over \$6,000 this year. Here is the very promising beginning of a program of research throughout the year in accordance with a policy which, we have reason to believe, permits the Laboratory to continue its development as an institution whose benefit to humanity is of outstanding value.

The following have given financial support to the Women's Auxiliary fund: Mrs. C. M. Bleecker, Miss Rosina C. Boardman, Mrs. George Crocker, Mrs. Paul Cushman, Mrs. H. P. Davison, Mrs. H. W. De Forest, Mrs. Marshall Field, Mrs. Luis J. Francke, Mrs. Childs Frick, Mrs. Rodman Gilder, Mrs. Henry Hicks, Mrs. Walter B. James, Mrs. Walter Jennings, Miss Abbie E. Jones, Miss S. E. Jones, Mrs. Otto H. Kahn, Mrs. R. C. Leffingwell, Mrs. and Mr.

Wilton Lloyd-Smith, Mrs. Merle-Smith, Mrs. George Nichols, Mrs. Gurdon Parker, Mrs. John Rankin, Mrs. Emlen Roosevelt, Mrs. John Rousmaniere, Mrs. J. H. J. Stewart, Mrs. Robert Thorne, Mrs. H. E. Walter, Mrs. T. S. Williams, Mrs. Willis D. Wood, Mr. Walter Jennings, and Col. T. S. Williams.

In addition, Mrs. George Nichols, Mrs. J. H. J. Stewart, and Mrs. Reginald G. Harris have contributed to the furnishings of Blackford Hall. Mrs. Harris also gave a wall fountain, which she designed.

### **The Wawepex Society**

The Wawepex Society, under the leadership of Charles M. Bleecker, Governor, Jesse Knight, Scribe, and Walter J. Whipple, Custodian, continues to lease certain buildings and grounds, and to give financial support to the Laboratory in the generous manner of its founder, Mr. John D. Jones.

### **Repairs and Equipment**

Much of the repair of buildings this year has been carried out with an aim to provide more and better living accommodations for research workers and their wives. With this end in view, the fine old house located on the Townsend Jones' property, purchased two years ago, was considerably improved. The roof was reshingled, the chimneys repaired, one ell was rebuilt, the top floor was remodelled and replastered, all of the windows were reputtied, the trim of the windows and doors was repainted, and two bathrooms were installed. These improvements substantially increased our living accommodations, and, together with others, enlarged our receipts from rental by about fifty per cent. The other improvements included the installation of two additional baths in Hooper Hall, and certain additional minor changes.

The largest single addition to our housing facilities was the purchase, from Mrs. Althea Stewart, upon very generous terms, of a cottage on the south side of the Cold Spring Harbor-East Norwich Pike, near the Laboratory. This cottage, in very good condition at the time of its purchase, has eight rooms and a bath, running water and electricity. We have recently installed, in this cottage, a steam heating plant, the gift of Col. Williams, and are planning to add another bath.

In recognition of Mrs. Stewart's generous terms, and of the late Mr. Stewart's and her long and active interest in the Laboratory, the cottage is called the Stewart Cottage.



The Laboratory is becoming continually better equipped for biological research, and the past year has brought pleasing progress in this respect.

### **Gifts Received During the Year**

Mr. and Mrs. Acosta Nichols' gift of over \$20,000 is reported elsewhere, under the George Lane Nichols Memorial.

The fund raised by the Women's Auxiliary, in support of current research upon X-rays and other biophysical problems, totaled over \$6,000.

Mr. Mortimer L. Schiff contributed \$5,000 to the research fund, in addition to his annual contribution.

Mr. William K. Vanderbilt has pledged \$2,500 to the same fund.

Colonel T. S. Williams gave \$1,000 to the Women's Auxiliary, and \$800, covering the cost of installing heat in the Stewart Cottage.

The Wawepex Society continued its annual gift of \$1,500 in addition to the John D. Jones Scholarship in favor of a student at the Biological Laboratory from Columbia University.

The following persons contributed \$1,000 each: Mr. Marshall Field, Mr. Walter Jennings, Mr. William J. Matheson, Mr. J. P. Morgan, Mr. Herbert L. Pratt; and \$1,000 was received "In loving memory of George Lane Nichols."

Grateful acknowledgment is made for the many gifts of less than \$1,000 which have gone far to make possible the valuable accomplishments of the year.

### **Supporting Institutions**

Thirty-seven colleges, universities, and medical schools were represented at the Laboratory this year.

The following institutions supported the work of the Laboratory by granting scholarships in their institutions applicable to the Biological Laboratory, or by a loan of equipment, or by giving financial aid to members of their institutions in residence at the Laboratory.

Adelphi College  
Brown University  
College of the City of New York  
Columbia University  
Cornell University Medical School  
Hunter College  
Johns Hopkins University  
Mount Holyoke College

New York University  
Smith College  
University of Georgia  
Medical School  
University of Kansas  
University of Pennsylvania  
University of Pittsburgh  
Yale University

## **Gardens Opened to The Biological Laboratory**

Under the direction of Doctor H. S. Conard, the visiting of gardens in the vicinity of the Laboratory has become an important part of the work in botany, and a source of instruction, inspiration, and pleasure to other workers at the Laboratory. Last summer the following persons very generously opened their gardens to the members of the Laboratory: Mr. W. R. Coe, Mrs. Henry W. DeForest, Mrs. Robert DeForest, Mr. Anton G. Hodenpyl, Mrs. Walter B. James, Mr. and Mrs. Walter Jennings, Mr. Otto Kahn, Mr. William J. Matheson, Mrs. Theodore Roosevelt, Sr., Mr. Louis C. Tiffany, (Art Foundation, house, and gardens), and Mr. William K. Vanderbilt, (Museum.)

## **The Scientific Advisory Committee**

The Scientific Advisory Committee of the Laboratory has continued to be extremely helpful under the able leadership of its chairman, Doctor J. H. Bodine of the University of Pennsylvania. The membership of the Committee this year was Doctors Andrews, Conard, Kleiner, Kornhauser, Nicholas, Osterhout, Parshley, Salant, Schaeffer, Smith, Sparrow, Swingle, and Walter.

A special Scientific Advisory Committee concerned with research in general physiology and biophysics was appointed. This committee was composed of Doctor W. J. V. Osterhout, Rockefeller Institute, Chairman, Doctor J. H. Bodine, University of Pennsylvania, Doctor W. J. Crozier, Harvard University, and the Laboratory Director. This committee was particularly active in planning for the work in biophysics which is now being carried on.

Reports of both scientific advisory committees are appended to this report. The Director of the Laboratory takes this occasion to express his appreciation of the activity of these committees, whose advice has continued to be of the greatest value.

Finally, I desire to make acknowledgment to our President, Mr. Arthur W. Page. Our progress reflects his active leadership, and his amazing ability to find time, under almost any conditions, to consider the problems and welfare of the Laboratory.

REGINALD G. HARRIS.

## **Second Annual Report of the Scientific Advisory Committee of The Biological Laboratory, Cold Spring Harbor**

The matters of chief interest to the scientific advisory committee during the past year have been concerned largely with policy. Interest in the laboratory as an institution affording unique possibilities as a research center has grown considerably during the past year. The establishment of higher standards, both in type of courses offered at the laboratory and students chosen, has added much to strengthen the scientific status of the laboratory.

Present indications for the coming season, especially as regards research personnel, are extremely gratifying.

To further successfully carry out and maintain the high standards adopted by the institution calls for an adequate endowment. The committee strongly favors serious consideration of plans for raising an endowment sufficient in amount to maintain and insure the laboratory as an institution of the highest scientific standards.

J. H. BODINE, *Chairman*  
University of Pennsylvania.

## **Report of the Special Scientific Advisory Committee on General Physiology and Biophysics**

The Advisory Scientific Committee have suggested the appointment of Dr. Hugo Fricke for a period of three years. Dr. Fricke is one of the few able men who have come from physics into biology. It happens that biology, which has been backward in applying the recent discoveries in physics, is particularly in need of precisely what Dr. Fricke can give and it is very fortunate that he has been secured. It would not be desirable for him to take an academic position for his time would of necessity be largely given to teaching. The position at Cold Spring Harbor is ideal from this standpoint and the Laboratory has rendered a real service to science and to itself by providing a place for his work.

Dr. Fricke has attacked with signal success some of the most difficult biological problems such, for example, as the electrical resistance of single cells. His work in this field has thrown important light on the nature of protoplasm. He has been able to distinguish between malignant and benign tumors by their difference in electrical capacity. He has done work of unusual interest on X-rays. These lines of investigation may serve to give some notion of the scope of his work, all of which is marked by signal ability and keen discrimination.

He has begun the fitting up of his laboratory at Cold Spring Harbor and as soon as this task is finished he will be able to proceed with the important investigations he wishes to take up.

W. J. V. OSTERHOUT, *Chairman*

## REPORTS OF RESEARCH-WORKERS

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### Doctor Schaeffer's Report

"The main problem is to learn more of the nature of the mechanism producing spiral movements in organisms. Since the accumulated observations seem to point to the molecule and its movements as the most probable spiral machinery, the effects of electric and magnetic fields and ultra violet radiation on amebas and leucocytes in small capillary tubes are being tested, since these agencies seem specially suitable for this purpose. So far only magnetic fields have been tried out intensively. In a strong magnetic field amebas move more rapidly than in a non-magnetic field. The same appears to be true of the leucocytes, although the experiments on leucocytes have not gone far enough yet for comparative purposes.

"The effect of the magnetic field seems to be widespread, attaching particularly to protoplasmic movement. If this is true, the implications of this effect would, of course, be very widespread, since the general differentiating process and at least certain phases of nerve transmission depend on protoplasmic movement.

"So far as I know, no definite magnetic effects of a morphological or physiological character have been demonstrated heretofore, although numerous attempts have been made. (The success in finding an effect is due to more accurate and more frequent measurements.)

"Whether the magnetic field sets up induced currents in the moving ameba, or merely establishes potential differences or whether there is a direct effect on molecular orientation, cannot be stated, although the first of these possibilities seems remote owing to the fact that the position of the moving ameba in the magnetic field makes no perceptible difference.

"The work this summer is directed toward finding a leucocyte that moves uniformly over considerable periods of time. Molluscs, salamanders, and insects are being examined with this end in view. The most generally useful organisms for this investigation, however, are the amebas.

"Certain minor observations on other organisms are also being made, such as spiral movements of identical twins, in man, to throw further light on the probable correlation between temperament and general character of path; on a growing animal, rat, mouse, at various ages, etc."

### **Dr. Kleiner's Report**

"The investigation which I am carrying on here is, in brief, a study of the nature of the sugar in the blood in diabetes. This is a continuation of earlier studies by the dialysis method, and I hope to include the action of insulin on diabetic blood sugar in my studies here.

"If we can determine the mechanism of insulin's action, or even the exact mechanism of the production of experimental diabetes, we may hope for the discovery of a more effective and safer therapeutic agent than insulin."

### **Dr. Salant's Report**

"1. Studies on the effect of mercury on the autonomic nervous system [the fibers of the motor nervous system which operate independently of the brain and spinal cord]. The results obtained indicate that intravenous injection of small amounts of mercury succinate greatly increases the irritability of the inhibitory mechanism of the heart. This is of practical importance especially since soluble salts of mercury are given intravenously in different conditions for therapeutic purposes.

"Studies of the effect of mercury on smooth muscle, which are also being carried on in the Laboratory this summer, likewise showed that the substance is very active. This result may explain the mode of action of mercurial purgatives and may show important differences in the reactions of different tissues to the same substances. In other words, it may show fundamental differences in the biological properties of various kinds of muscles.

"2. Experiments are in progress on the effect of calcium on the toxicity of drugs. Carbon tetrachloride, an anthelmintic used against hookworm, is the substance studied. It is hoped that similar studies will be made with other substances in relation to calcium and also to diet. These investigations are of very great importance for therapeutic and clinical medicine as well as for biology."

### **Dr. Corey's Report**

"The problem with which I am employed is the discovery of the earliest reaction of the mammal (rat) to the hormonal secretion of the pars anterior of the pituitary gland.

"The method of procedure has been injection, both pre and post-natal, of young rats with the macerated substance of the pituitary. Employing .9% NaCl as a medium, it has been ascertained that this

earliest response occurs between the 10th and 15th days of post-natal life, in both sexes.

"A second series of experiments was completed in which blood plasma was used as a medium rather than the saline solution. This was done to serve as a check upon the former work.

"In all cases the gonad response to the pituitary secretion has been used as an indicator.

"At this Laboratory it is my purpose to examine the gonads of the animals of this latter series in order to ascertain the time of the earliest response, and, if time permits, to discover whether increased tubule length in the testis accounts for the peculiar histological structure observed in previous work. The testicular response to the pituitary hormone appears to be one of the most important aspects of the work."

#### **Doctor Little's Report**

"Two lines of investigation are being pursued:

"1. The pineal gland of *R. catesbiana*. Both removal and grafting have been attempted. Mammal tissues are being used, in addition to the glands of the species under investigation. The results are not in such shape as to warrant conclusions.

"2. During the summer I have begun work on tissue grafting into rat foetuses. This is mainly testicular grafts, in an attempt to produce free-martins."

#### **Doctor Andrew's Report**

"In collaboration with Mr. Eugene Schumaker I am completing a series of determinations upon the blood cell changes in white or hooded rats during a pathogenic trypanosome infection (*T. equiperdum*). In addition to observations upon the blood cells I am making sugar determinations upon the blood of dying animals, and hope to make pH determinations as well. This type of work you may recognize as a part of the program for the study of the host-parasite relations which is in progress at our school. The particular point in which I am interested is the way in which trypanosomes kill their rat host—i.e. the series of biological and biochemical changes in host and parasite which eventuate in the death of the host."

#### **Doctor Kornhauser's Report**

"Subject: The Differentiation and Growth of the Sea-Side Earwig, *Anisolabis maritima* Bon.

"1. The differential mitosis resulting in oöcyte and nurse cell.

"2. Changes in oöcyte and nurse prior to orientation in long axis of egg string: correlation of nuclear phenomena with growth of the sister cells.

"3. Activity of the nurse cell in providing oöcyte with material. (Supra vital staining.)

"4. The role of the amoebocytes (blood cells) in the growth of the ovum: especially in the formation of yolk. The Golgi apparatus and yolk. (a) Supra-vital, (b) Da Fano, (c) Mann-Kopsch methods.

"5. Deposit of fatty acids, lipoids, and fat in the oöcyte. Lorrain-Smith method.

"6. Role of mitochondria in oöcyte growth. (a) Supra-vital, (b) Benda methods.

"Object: Increase our information regarding the activities of cells."

#### Doctor Smith's Report

"The general subject of the research which I am carrying on this summer is the study of blood rhythms. The study of leucocytic rhythms includes the study of the variations in the white cells from 4 P.M. to 12 P.M., (work being done already on the changes from 8 A.M. to 4 P.M.), the presence or absence of digestive leucocytosis, and the study of the fat in the blood in its relation to the blood counts. This is all a continuation of the work which we have been doing the past two years at Mount Holyoke. A study is being made also of the variations from day to day in the red blood cell picture and in the haemoglobin determinations. This is being done by making half hour counts for periods of 4 hours every day for a week or ten days, with intervals of about a month between each series."

#### Doctor Jenkins' Report

"I am collecting material for a study of the normal development of *Fundulus*, all stages. I have been studying the living egg before fixing it. I shall section serially each stage, and study the slides later, in the winter.

"I am also testing out this material to determine its value for experimental work.

"There is no complete monograph embodying the above. The material will be compared with the trout, amphibian, avian, and mammalian series in order to study better certain stages of development."



### **Doctor Conard's Report**

Doctor Conard reports that the work included,

"Description and classification of the plant communities of Cold Spring Harbor and vicinity, by quantitative methods, continued from last year, with a view to the preparation of a detailed paper on the subject.

"Special study of the mosses, to determine what species are present, with a view to the study of the 'indicator' value of mosses for horticulture, agriculture, forestry, etc.

"Re-study of vegetation described in former publications:

"1. Belt-transect of Sandspit.

"2. Belt-transect of Saltmarsh.

"3. Revegetation of a Denuded Area."

### **Mr. Sparrow's Report**

"Mycological work in the Botanical Laboratory is at present directed toward two main projects.

"The first of these is a morphological, taxonomical, and ecological study of the aquatic Phycomycetes of the Cold Spring Harbor region. Work was started last year when the writer collected fifteen genera, all previously unreported from Cold Spring Harbor, and several heretofore not found in this country. The study has been continued, somewhat, during the past winter by means of cultures sent from the Biological Laboratory and maintained in the Cryptogamic Laboratories of Harvard University, and has yielded several interesting forms, including a new species of one of the rarer Chytridinae.

"Miss Myrtle Carroll, a graduate of Adelphi College, Dorothy Frances Rice Scholar in botany, is assisting in a continuation of the studies at Cold Spring Harbor and has added several more genera of Phycomycetes to the list.

"An aquatic fungus flora of the region would be an exceedingly desirable contribution to the mycological literature of our country, not only because this particular group of organisms has long suffered from neglect and poor treatment on the part of previous investigators, but also for the reason that we, admittedly, know little of the life histories and distribution of these fungi.

"The region is unquestionably rich in these organisms and it is only a question of time and of the opportunity to collect at all seasons of the year, especially in the spring when most of the rarer forms abound, to add a real contribution to our knowledge of them.

This project is not intended to be a mere list of species but a critical illustrated study of the developmental features of the fungi, as well as such taxonomical and ecological treatment as may be necessary.

“The second project, and one in which the writer is particularly interested at present, is the extension of the range of hosts of several fungus parasites of algae belonging to the genus *Pythium*, some members of which are exceedingly destructive parasites of crop plants. An attempt is being made to determine, at least in a general way, the physiological factors which govern the relative susceptibility or non-susceptibility of an alga to the fungus. This phase of the work is particularly important in the case of fungi found only as parasites of higher plants, for if these fungi can be made to parasitize lower forms of vegetable life, such as algae, we have at least a glimpse of the probable origin of many of our important crop plant diseases, a subject in need of considerable investigation.”

## Report of the Treasurer

BALANCE SHEET NOVEMBER 30, 1928

### EXHIBIT A

#### ASSETS

*Current Assets:*

Cash—Bank of Huntington.....	\$43.06	
Cash—Bankers Trust Company.....	6,072.48	
		\$6,115.54

*Endowment Fund Assets:*

Securities.....	\$23,068.75	
Blackford Memorial Fund.....	5,000.00	
Temple Prime Scholarship Fund.....	2,500.00	
Dorothy Frances Rice Scholarship Fund.....	2,000.00	
Doctor Walter B. James Bequest.....	5,000.00	
		37,568.75

*Land Assets:*

Land Purchased.....	\$71,380.52	
Land (On 51 Years' Lease).....	13,500.00	
		84,880.52

*Building Assets:*

Blackford Hall*.....	\$75,000.00	
Jones Laboratory*.....	25,000.00	
Physiology Laboratory.....	20,000.00	
George Lane Nichols Memorial.....	20,000.00	
Wheeler House.....	11,466.34	
Stewart Cottage.....	8,842.82	
Hooper Hall*.....	20,546.26	
Research Laboratory*.....	7,500.00	
Cottage*.....	5,500.00	
		193,855.42

*Accounts Receivable:*

Donations Receivable.....	\$2,500.00	
Accrued Interest on New Securities.....	232.16	
		2,732.16

*Fixed Assets:*

	\$19,089.40	19,089.40
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\$344,241.79

\*Situated on property on 51 years' lease from Wawepex Society.

## LIABILITIES

### *Current Liabilities:*

Accounts Payable.....	\$1,133.52	
Wages Payable.....	83.60	
		\$1,217.12

### *Capital:*

Long Island Biological Association.....	\$253,690.46	
Wawepex Society.....	46,500.00	
		300,190.46

Surplus, 1927.....	\$8,467.02	
*Surplus, 1928.....	34,210.50	
		42,677.52

Temple Prime Fund (Balance).....		56.69
Dorothy Frances Rice Fund (Balance).....		100.00

\$344,241.79

### *\*1928 Surplus Reflected in Following Accounts:*

Increase in Cash (Net).....	\$4,823.88
Increase in Endowment Fund	568.76
George Lane Nichols Memorial Building.....	20,000.00
Equipment.....	4,127.92
Appreciation on Buildings.	1,955.42
Accounts Receivable.....	2,732.16

EXHIBIT B  
INCOME ACCOUNT

*Income:*

General Contributions.....	\$39,968.00	
Women's Auxiliary Contributions.....	6,435.00	
Endowment Interest.....	1,223.76	
Tuition.....	3,552.50	
Rentals.....	2,980.44	
Dining Hall Receipts.....	887.47	
Storeroom.....	44.38	
Temple Prime Fund (Exhibit C).....	56.69	
Dorothy Frances Rice Fund (Exhibit C).....	100.00	
Blackford Memorial Fund (Exhibit C).....	147.25	
Doctor Walter B. James Bequest.....	190.36	
		\$55,585.85

*Expense:*

Salaries.....	\$14,536.78	
General Expense.....	2,770.54	
Supplies.....	1,473.18	
Repairs.....	291.38	
Building Maintenance.....	436.75	
Biological Supplies.....	479.32	
Survey of Land.....	708.86	
Biophysics Department.....	521.85	
		21,218.66
Surplus on Current Account, 1928.....		34,210.50
Temple Prime Fund (Balance).....		56.69
Dorothy Frances Rice Fund (Balance).....		100.00
		\$55,585.85

## EXHIBIT C

### (1) TEMPLE PRIME SCHOLARSHIP FUND

Donor: Cornelia Prime. 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."

Invested: See Report of Finance Committee.

Balance, 1927.....	\$94.21	
Interest, 1928.....	137.48	
		\$231.69
<i>Disbursements:</i>		
Scholarship, A. H. Ravin.....	\$100.00	
Scholarship, Sadie Mahon.....	75.00	
		175.00
Balance on Hand.....		\$56.69

### (2) DOROTHY FRANCES RICE FUND

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

To apply income 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.

Invested: \$2,000, International Mercantile Marine, 6's.

Balance, 1927.....	\$180.00	
Interest, 1928.....	120.00	
		\$300.00
<i>Disbursements:</i>		
Scholarship, Myrtle Carroll.....	\$100.00	
Scholarship, Gladys Galligar.....	100.00	
		200.00
Balance on Hand.....		\$100.00

### (3) BLACKFORD MEMORIAL FUND

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

Invested: See Report of Finance Committee.

Balance, 1927.....	\$59.25	
Interest, 1928.....	275.00	
	<hr/>	\$334.25
<i>Disbursements:</i>		
Furniture.....	\$80.50	
Curtains.....	47.25	
	<hr/>	127.75
		<hr/>
Balance on Hand.....		\$206.50

### (4) WALTER B. JAMES FUND

Bequest, in trust, of Walter B. James (1927). Principal, \$5,000.  
"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 Asso-  
ciation of Cold Spring Harbor, Long Island."

Invested by Trustee, Equitable Trust Co., New York, as follows:

1000 New York City 4's,  
2000 Atchison, Topeka & Santa Fe Ry. 4's,  
2000 New York Central R.R. Co. 4½'s.

Received, 1928.....	\$190.36
Transferred to Income Account.....	190.36

MARSHALL FIELD, *Treasurer*

REGINALD G. HARRIS, *Assistant Treasurer*

WILLIAM F. DEAN, *Assistant Treasurer and Accountant*

## Report of the Finance Committee

The Finance Committee has received \$29,750 plus accrued interest (\$409.06) from the Brooklyn Institute of Arts and Sciences, being the transfer of the endowment Fund of the Temple Prime Scholarship Fund, and of the Blackford Memorial fund of the Laboratory from the Institute to the Association. The funds were invested as follows:

Quantity	Description	Price	Amount	Interest	Comm.	Net Amount
50 Shrs. C/S	Illinois Central R.R.	141 $\frac{5}{8}$ Plus Comm.	\$7,081.25	....	\$12.50	\$7,093.75
100 Shrs.	Bucyrus Erie Co. 7.50 Conv. Pref. Stock	45 Plus Comm.	4,500.00	....	15.00	4,515.00
5000	Montecatini 7% due 1937 J. & J. ex-Warrants	94 $\frac{1}{4}$ Plus Comm.	4,712.50	\$129.31 133 Days	10.00	4,851.81
2000	United Light & Rwys. Deb. 5 $\frac{1}{2}$ % due 1952 F. & A.	96 Plus Comm.	1,920.00	\$31.47 103 Days	4.00	1,955.47
3000	United Light & Rwy. 5 $\frac{1}{2}$ % due 1952 F. & A.	95 $\frac{3}{4}$ Plus Comm.	2,872.50	\$47.21 103 Days	6.00	2,925.71
50 Shrs.	Illinois Power & Lt. Corp. 6% Pref.	98 Flat	4,900.00	....	....	4,900.00
5000	Free State of Prussia 6% due 1952 A. & O. 15	90 $\frac{1}{2}$ Plus Comm.	4,525.00	\$24.17 29 Days	10.00	4,559.17
				\$232.16		\$30,800.91



## Report of the Secretary

During the calendar year 1928 the fifth annual meeting of the corporation was held (on July 31st); also 3 meetings of the Board of Directors, as follows:

*a. The 14th meeting of the Board of Directors was held at Cold Spring Harbor, June 6, 1928.* Col. Williams reported that progress was being made in the matter of the transfer of funds from the Brooklyn Institute to the Association. It was voted that the laboratory endowment funds, now in the hands of the Brooklyn Institute, be recognized as a permanent endowment of the Association for the purposes of the Biological Laboratory; that they are not to be dissipated and the income from them only is to be expended. The Board expressed regret on the death of a patron, William H. Nichols, Jr., who contributed generously to the work of the Laboratory. The laboratory director proposed that the Board consider the policy of increasing the number of investigators at the laboratory as rapidly as is consistent with our facilities and to decrease the number of those receiving instruction. Also that facilities at the Laboratory should be available throughout the year, as far as funds permit. The policy was adopted, in principle, and it was voted to have the laboratory director submit further details to the Board at its December meeting.

*b. The 15th meeting of the Board of Directors was held at the George Lane Nichols Memorial, Cold Spring Harbor on July 31st, 1928.*

The following officers were elected for the coming year: President, Arthur W. Page; Vice-President and Treasurer, Marshall Field; Secretary, C. B. Davenport; Assistant Treasurers, R. G. Harris and William Dean were continued. The following members were elected to the Executive Committee for the coming year: Marshall Field, Walter Jennings, R. C. Leffingwell, W. J. V. Osterhout, Arthur W. Page, T. S. Williams, C. B. Davenport. Col. Williams, chairman of the committee on transfer of funds from the Brooklyn Institute to the Association, reported that consents had been received from all surviving donors to the endowment fund and that a petition of transfer of funds had been prepared by the Brooklyn Institute for presentation to the Court. A finance committee was elected to receive and handle the permanent funds of the Association as follows: the president and treasurer, ex officio; also Messrs. Jennings, Leffingwell and Wood.

*The 16th Meeting of the Board of Directors* was held at India House, New York City, Tuesday, December 4th, with President Page in the chair. The treasurer's report was read, as printed in this annual report. The finance committee reported that it had received \$29,750 plus accrued interest, being the transfer of the endowment fund of the laboratory from the Brooklyn Institute to the Association. The report of the special advisory committee on physiology and biophysics was read by Dr. Osterhout, as elsewhere printed in this report. A report of the scientific advisory committee of the laboratory was presented by Dr. Bodine, as printed elsewhere in this report. The annual report was read by the director and the budget, amounting to \$54,855 was authorized. Professor Felix Bernstein was invited to work at the laboratory during the winter and spring of 1929.

C. B. DAVENPORT, *Secretary*

## THE LABORATORY STAFF

- \*REGINALD G. HARRIS..... Director, The Biological Laboratory  
Experimental Zoology
- H. E. WALTER..... Professor of Biology, Brown University  
Field Zoology
- †W. W. SWINGLE..... Professor of Zoology, University of Iowa  
Endocrine Biology
- H. S. CONARD..... Professor of Botany, Grinnell College  
Botany
- J. H. BODINE..... Professor of Zoology, University of Pennsylvania  
General Physiology, Chairman of Scientific Advisory Committee
- \*HUGO FRICKE..... The Biological Laboratory  
Biophysics
- JUSTIN ANDREWS, Associate in Protozoology, School of Hygiene  
and Public Health, John Hopkins University  
Surgical Methods in Experimental Biology
- HOWARD M. PARSHLEY..... Professor of Zoology, Smith College  
Field Zoology
- S. I. KORNHAUSER, Professor of Anatomy and Embryology,  
University of Louisville  
Field Zoology
- J. S. NICHOLAS..... Assistant Professor of Zoology, Yale University  
Research in Embryology
- W. J. V. OSTERHOUT..... Rockefeller Institute for Medical Research  
Research in Physiological Botany
- ASA A. SCHAEFFER..... Professor of Zoology, University of Kansas  
Research in Protozoology
- WILLIAM SALANT, Professor of Pharmacology, University  
of Georgia Medical School  
Research in Pharmacology
- CHRISTIANNA SMITH, Associate Professor of Zoology,  
Mount Holyoke College  
Research in Histology

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†Leave of absence for 1928.

\*In residence throughout the year.

I. S. KLEINER, Professor of Physiological Chemistry, New  
York Homeopathic Medical College and Flower Hospital  
Research in Physiological Chemistry

GEORGE F. SYKES, Assistant Professor of Anatomy, Tufts  
Medical School  
Associate in Field Zoology

FREDERICK K. SPARROW, Department of Botany, Harvard University  
Assistant in Botany

ROY A. WAGGENER.....Instructor in Biology, Brown University  
Assistant in Field Zoology

\*KATSUHEI MIYAMOTO.....Chemist

\*P. J. O'GRADY.....Mechanic

EUGENE SCHUMAKER.....Johns Hopkins University  
Assistant in Experimental Surgery, Chemical Supplies

CHARLES B. DAVENPORT, Director, Department of Genetics,  
Carnegie Institution of Washington  
Lecturer

GRACE M. LOWE.....Nature Study for Children

\*M. CATHERINE HINCHEY.....Executive Secretary

\*CATHERINE R. BROWN.....Secretary

\*THOMAS WHEELER.....Collector and Caretaker

\*FRANK ALLEN.....Carpenter and Boatman

The Staff of the Department of Genetics of the Carnegie Institution of Washington contributes to the scientific life of the Biological Laboratory by occasional lectures and demonstrations and by voluntary cooperation with investigators in residence at the Laboratory.

## Persons in Residence at the Laboratory in 1928

### IN ADDITION TO MEMBERS OF THE STAFF

Name	Registration	Institution	Graduate or Undergraduate
R. Irving Blanchard, Jr.	F. Z.	Brown University	Undergraduate
Alpheus W. Blizzard	F. B.	Coker College	Professor
Frances Bober	F. B.	Adelphi College	Undergraduate
Dorothy Boriss	F. Z.	Hunter College	Undergraduate
Beatrice M. Brodman	R.	Columbia University	Graduate
Keeve Brodman	R.	Cornell University Medical School	Undergraduate
Anne W. Brooks	F. Z.	Texas Christian University	Graduate
Beth Burgess	F. B.	University of Chicago	Undergraduate
Edgar T. Campbell	F. Z.	Johns Hopkins University	Undergraduate
Myrtle C. Carroll	F. B., R.	Adelphi College	Graduate
Henry W. Clapp	F. Z.	Michigan State College	Undergraduate
Myrta Susan Coons	F. Z.	Michigan State College	Undergraduate
Elizabeth A. Copeland	F. Z., & E.	Smith College	Undergraduate
John H. Cornhelsen, Jr.	F. B.	Dartmouth College	Undergraduate
Lilian K. Dumble	F. Z.	Texas Christian University	Graduate
William C. Foster, Jr.	F. Z., & E.	Brown University	Undergraduate
Gladys C. Galligar	F. B.	James Millikin University	Undergraduate
Isabel Ginsberg	F. Z.	University of Pennsylvania	Undergraduate
Katharine W. Haines, Jr.	F. B.	Grinnell College	Undergraduate
Margaret Harland	R.	Mount Holyoke College	Undergraduate
Charles Hodge, Jr.	R.	University of Pennsylvania	Graduate
Leonore B. Hollander	S. M., E. & R.	Bryn Mawr College	Graduate
Harold B. Hudson	F. Z.	University of Pittsburgh	Graduate
John R. Huggins	R.	University of Pennsylvania	Graduate
Charles A. Iglauer	G. P.	University of Cincinnati	Undergraduate
George B. Jenkins	R.	George Washington Uni- versity Medical School	Professor
Lucille Kahn	F. Z.	Hunter College	Graduate
E. Corinne Keaty	G. P.	Louisiana State University	Graduate
Elizabeth W. Kingsbury	F. Z.	Smith College	Undergraduate
Earl H. Laughlin, Jr.	S. M., E. & R.	University of Missouri	Undergraduate
Malcolm E. Little	S. M., R.	New York University	Professor
Hwei-ling Lu	R.	Columbia University	Graduate

E.:Endocrinology.

F. B.:Field Botany and Plant Ecology.

F. Z.:Field Zoology.

G. P.:General Physiology.

S. M.:Surgical Methods in Experimental Biology.

R.:Research.

Name	Registration	Institution	Graduate or Undergraduate
Frank Lutz	F. Z.	Brown University	Undergraduate
Sadie Elizabeth Mahon	F. Z.	Texas Christian University	Instructor
May Mandelbaum	F. Z.	Barnard College	Undergraduate
Dorothy E. Mossner	F. Z.	Hunter College, Barnard	Graduate
Mervin G. Pallister	F. B.	Dartmouth College	Undergraduate
Henry S. Pratt	R.	Haverford	Professor
Abe Ravin	F. Z.	Colorado University	Undergraduate
Royal P. Richardson	F. Z.	Brown University	Graduate
Arthur C. Risser	F. B.	Grinnell College	Undergraduate
Eleanor Rosenberg	F. Z.	Barnard College	Undergraduate
John C. Sarafian	F. Z.	Brown University	Undergraduate
Lorrimer M. Schmidt	F. B.	University of Missouri	Graduate
Julius Schwartz	F. Z.	College of the City of New York	Graduate
Fiorindo A. Simione	F. Z.	Brown University	Undergraduate
Marian E. Smith	F. Z.	Adelphi College	Undergraduate
Milton F. Stancati	F. Z.	University of Pittsburgh	Undergraduate
Melvin W. Thorner	R.	University of Pennsylvania	Graduate
Elizabeth M. Yagle	R. & E.	University of Pennsylvania	Instructor

E.:Endocrinology.

F. B.:Field Botany and Plant Ecology.

F. Z.:Field Zoology.

G. P.:General Physiology.

S. M.:Surgical Methods in Experimental Biology.

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