the branch experiment stations, was killed in an automobile accident on September 14. He was sixty-three years old. Professor Musbach was a member of the American Association for the Advancement of Science and other scientific societies.

DR. CHARLES JASTROW MENDELSOHN, of the College of the City of New York, cryptographer, known for his work on the mathematics of code-word structure and the theory and structure of the cable codes, died on September 27 at the age of fifty-eight years.

SCIENTIFIC EVENTS

THE ARNOLD ARBORETUM EXPEDITION TO NORTHWESTERN CANADA

THE Arnold Arboretum expedition of 1939 to the Mackenzie basin of northwestern Canada returned to Boston on September 28. It left for the field on May 20, and arrived on June 9 at Fort Simpson on the Mackenzie River. On June 16 a chartered airplane was used for the journey to Brintnell Lake, approximately 200 miles west of Simpson. This lake lies at about 2,600 feet above sea-level and is surrounded by mountains ranging from 6,000 to 9,000 feet above the sea. Its position is in lat. 62° 5′ N., long. 127° 35′ W. The party remained there until August 20, when they returned to Simpson by plane. The boat journey southward was begun on September 8.

Approximately 1,000 field numbers of vascular plants, 620 of lichens and 60 of fungi, altogether about 15,000 herbarium specimens, were collected, mainly at Brintnell Lake and in the vicinity of Fort Simpson. The chief objectives of the trip were collections and notes on local vegetation in the Mackenzie Mountains of the South Nahanni River region, in which Brintnell Lake is situated. The lake is at the margin of the Snyder Range, a group of high mountains about the headwaters of the South Nahanni, and lies in one of the least known regions, biologically speaking, in boreal America. In fact, practically no botanical material from the whole Mackenzie Mountain system had been collected prior to this summer; and it was especially desirable in view of projected plans for a new floristic work on the northern parts of the continent.

The 1939 expedition was supported by the Arnold Arboretum and by liberal grants from the Milton Fund of Harvard University, the American Academy of Arts and Sciences and the National Academy of Science. The National Museum of Canada contributed substantially by the loan of field equipment. The party consisted of Dr. and Mrs. Hugh M. Raup, their two sons and James Soper, of Hamilton, Ontario.

HUGH M. RAUP

THE BISHOP ORNITHOLOGICAL COLLECTION

THE Field Museum of Natural History, Chicago, has recently concluded arrangements to acquire the Bishop collection of more than 50,000 North American birds, one of the largest and most important private collections ever assembled and the last of its kind which had not passed to a public institution. The negotiations to obtain this collection were recently completed by Dr. Wilfred H. Osgood, chief curator of the department of zoology, on a visit to Dr. Louis B. Bishop at Pasadena, California. Dr. Osgood is an old friend of Dr. Bishop's, and in 1899 they conducted an expedition together to the Yukon and Alaska.

The Field Museum will obtain possession immediately of the major part of the collection, which is now housed at New Haven, Conn. The rest of it will remain in Los Angeles, where Dr. Bishop will continue work towards its improvement. It includes representatives of nearly all known forms of birds found in every section of North America north of Mexico, representing forty years of constant and intensive effort, both on the part of Dr. Bishop and of numerous professional ornithologists who have been associated with him at various times. According to Rudyerd Boulton, curator of birds at the museum, the specimens are distinctly superior to the average in quality of preparation. An important item is the inclusion of thirty type-specimens. Included also are specimens of various birds which are now extinct, such as the Carolina parokeet, the ivory-billed woodpecker, the Eskimo curlew and the passenger pigeon. Many others are of species which have become scarce and difficult to obtain.

Hitherto the principal efforts in ornithological research made by the museum have been devoted to the birds of Central and South America, Africa and other foreign localities. Although it has a collection in the North American field, this has been left largely to other institutions. The acquisition of the Bishop collection now gives to the museum one of the most comprehensive North American bird collections either in this country or abroad. It is estimated that it has cost its owner nearly $100,000, and it is doubtful if it could be reproduced at this time for double this amount.

THE LALOR FOUNDATION FELLOWSHIP AWARDS

THE Lalor Foundation has announced its fourth series of fellowship awards, authorizing grants of $20,000 for the academic year 1940–41. The individual awards range between $1,800 and $2,500 or according to the special needs of the candidate.

Six fellowships of the 1939–40 series are being ad-

ministered by the foundation, which was organized in 1935. The work of the holders of present fellowship awards is in the fields of physical chemistry, biochemistry and biophysics, and the institutions at which the researches are being conducted include the University of Oxford, Cornell University, Princeton University, the Johns Hopkins University, the Massachusetts Institute of Technology and the Johnson Institute of Biophysics of the University of Pennsylvania. The present war has caused almost complete abandonment of fundamental research in the belligerent countries, but the fellows who originally planned to work abroad have been able to make other plans for the coming year.

The awards in the 1940–41 series will be given for fundamental research work in any field of chemistry. Support for industrial research is not intended. The awards are open to both men and women and for work anywhere in the United States or abroad. Men and women in academic service who may be on leave of absence are among those eligible for appointment. Attainment of the degree of Ph.D. or training equivalent thereto is a requirement for candidacy. The final selections will be based on previous training, demonstrated competence and the promise of the candidates in their special fields of work.

It is pointed out in the official announcement that one of the important needs in science is to develop men who have a thorough background and training in fundamental chemical research and who have also adequate experience in the biological and medical sciences, qualifying them to attack with basic understanding research problems in the fields of biochemistry and chemotherapy. Accordingly, for a part of the Lalor awards, preference will be given to candidates directing their research toward applying the principles and discoveries of physical and organic chemistry to problems within these latter fields.

The qualifications of candidates will be passed upon by a selection committee consisting of Drs. C. A. Kraus, of Brown University; Arthur B. Lamb, of Harvard University; Roger Adams, of the University of Illinois; Hans T. Clarke, of Columbia University, and the secretary of the foundation.

Inquiries and requests for application forms for awards should be addressed to C. Lalor Burdick, Secretary, Lalor Foundation, Wilmington, Delaware. Applications should be in his hands by December 31, and appointments will be announced early in March, 1940.

SYMPOSIUM ON CRYOGENIC RESEARCH OF THE AMERICAN CHEMICAL SOCIETY

ON September 11, the week of the Boston meeting of the American Chemical Society, the Division of Inorganic and Physical Chemistry sponsored a symposium on Cryogenic Research, held at the George Eastman Laboratories of the Massachusetts Institute of Technology. It was at the Rochester meeting two years ago that the first symposium held in the United States for the presentation of papers and discussion on low temperature methods and research took place. The recent meeting furnished convincing evidence of an astonishing increase in interest, equipment and volume of research over the two-year interval. Our scientific colleagues from the Cryogenic Laboratory of the University of Toronto, H. Grayson Smith and J. O. Wilhelm, contributed two papers, and the Mond Laboratory of Cambridge, England, was represented by Dr. D. Shoenberg, who contributed a paper on super-electrical conductivity. Papers were presented also by representatives of the cryogenic laboratories of the National Bureau of Standards (F. G. Brickwedde, R. B. Scott, H. J. Hoge), the University of California at Berkeley (W. F. Giauque and J. W. Stout), the Pennsylvania State College (J. G. Aston and G. H. Messerly), the Johns Hopkins University (W. T. Ziegler), the California Institute of Technology (Alexander Goetz and A. Dember), Columbia University (H. A. Boorse, V. W. Cohen, C. Williams, S. L. Quimby), Cornell University (J. G. Kirkwood) and the Massachusetts Institute of Technology (S. C. Collins, R. B. Jacobs, C. Starr, C. C. Stephenson, J. G. Hooley, J. A. Beattie, B. E. Blaisdell, J. Kaye, C. A. Johnson and H. T. Gerry).

The symposium was in part devoted to the consideration of techniques and methods adapted to improving the precision and scope of a wide range of types of measurements at the lowest temperatures. The bulk of the day, however, was occupied with reports on the peculiarities of the heat capacities and thermodynamic properties of a variety of substances, the velocity of sound in liquid helium, its viscosity and flow peculiarities, phase transitions of the second kind, electrical superconductivity as related to conductor size, x-ray reflection intensities, thermal and magnetic properties of the para-magnetic salt nickel sulphate heptahydrate, among other items.

Professor Alexander Goetz gave a survey drawing attention to the remarkable advantages for many purposes which the special properties of matter at very low temperatures possess. The low temperature preservation of cell life, for example, should be of immediate practical interest in preserving many kinds of cells—blood corpuscles of varied types, for instance.

The most serious present obstacle to the rapid development of a more detailed and profound knowledge of the properties of matter and associated phenomena lies in the expensive equipment and the danger attending the manipulation of hydrogen and gases generally under high pressure. In this connection the report by the Massachusetts Institute of Technology group (S. C. Collins and R. B. Jacobs) of progress in the attempt to develop inexpensive mechanical means for continuously maintaining sub-hydrogen tempera-