Chemistry: Ross A. Gortner, University of Minnesota.
Astronomy: D. B. McLaughlin, Observatory, University of Michigan.
Geology and Geography: John L. Rich, University of Cincinnati.
Zoological Sciences: H. H. Plough, Amherst College.
Botanical Sciences: W. J. Robbins, New York Botanical Garden.
Anthropology: Frank M. Setzler, U. S. National Museum.
Social and Economic Sciences: Stanley D. Dodge, University of Michigan.
Historical and Philological Sciences: Tenney L. Davis, Massachusetts Institute of Technology.
Medical Sciences: L. R. Dragstedt, University of Chicago.
Agriculture: W. A. Albrecht, University of Missouri.
Education: S. R. Powers, Teachers College, Columbia University.

Members of the Executive Committee of the Council (for four years beginning January 1, 1940): R. E. Clausen, University of California; Karl T. Compton, Massachusetts Institute of Technology.

Elected Members of the Council (for four years beginning January 1, 1940): Arthur H. Compton, University of Chicago; Austin H. Clark, U. S. National Museum.

Nomination to the Board of Trustees of Science Service (for three years beginning April, 1940): J. McKeen Cattell, Garrison, N. Y.

Member of the Finance Committee (for four years beginning January 1, 1940): Frederick P. H. Siddons, American Security and Trust Company, Washington, D. C.

Members of the Committee on Grants: S. A. Mitchell (for Astronomy), Leander McCormick Observatory, Charlottesville; J. T. Buchholz (for Botany), University of Illinois; Dayton C. Miller (for Physics), Case School of Applied Science, Cleveland (to succeed the late Dr. F. K. Richtmyer).

SCIENTIFIC NOTES AND NEWS

DR. J. C. ARTHUR, emeritus professor of botany at Purdue University, observed his ninetieth birthday on January 11.

THE Perkin Medal, awarded annually by the American Section of the Society of Chemical Industry "for valuable work in applied chemistry," will be awarded to Dr. Charles M. A. Stine, director of research and vice-president of E. I. du Pont de Nemours and Company, at a joint meeting, presided over by Wallace P. Cohoe, with the American Chemical Society, American Institute of Chemical Engineers, the Electrochemical Society and the Society of Industrial Chemistry at the Chemists' Club, New York City, on January 12. The program will be as follows: "The Life and Accomplishments of C. M. A. Stine"—Dr. Harrison E. Howe. Presentation of the Perkin Medal—Dr. Marston T. Bogert. "The Rise of the Organic Chemical Industry in the United States."—Dr. C. M. A. Stine.

DR. WILLIAM J. GIES, professor of biochemistry at Columbia University, received the achievement medal of the Alpha Omega Dental Fraternity at the close of its convention held in New York City on January 2. The presentation was made by Dr. Samuel Birenbach, of New York. Dr. Gies is editor of the *Journal of Dental Research.*

DR. ROBERT A. BUDINGTON, professor of zoology at Oberlin College, was honor guest at a testimonial dinner in Columbus on December 28. Former students, members of the Oberlin faculty and colleagues from the Woods Hole Marine Biological Laboratory were in attendance. Dr. Budington will retire this June.

FRIENDS and colleagues tendered a testimonial dinner on December 3 to Frank C. Caldwell, professor emeritus of electrical engineering at the Ohio State University, with which he has been connected since 1893.

DR. W. D. FUNKHOUSER, professor of zoology and anthropology of the University of Kentucky, head of the department of zoology and dean of the Graduate School, was elected at the Columbus meeting president of the Entomological Society of America.

AT a meeting on December 12 of the American Section of the Society of Chemical Industry, announcement was made of the resignation of Dr. D. D. Jackson, professor of chemical engineering and head of the department at Columbia University, who had served as president of the society for the past seven years. Officers for 1940 were elected as follows: *President,* Professor Henri Mouquin; *Vice-president,* Dr. J. V. N. Dorr; *Treasurer,* H. S. Polin; *Secretary,* Jerome Alexander; *Members of the Council,* L. H. Baekeland, L. W. Bass, Gerard J. Berchet, M. T. Bogert, J. L. Costa, Prosper Cholet, James H. Hibben, D. D. Jackson, John R. Johnson, W. A. Noyes, Jr., and Atherton Seidell.

DR. LEON WILSON HARTMAN, since 1909 professor of physics at the University of Nevada, was installed on December 15 as president of the university.

DR. EDGAR H. NORRIS, since 1938 professor of pathology at the College of Medicine at Wayne University, Detroit, has been elected dean of the college. He succeeds Dr. Raymond B. Allen, who recently became executive dean of the Chicago colleges of the University of Illinois.

DR. WILLIAM V. LAMBERT, in charge of investigations in genetics for the Bureau of Animal Industry of the U. S. Department of Agriculture, has been named associate director of the Agricultural Experiment Station at Purdue University, effective on February 1. He will have direct supervision of research. Professor Harry J. Reed, assistant director for twenty-two years, became in July dean of the School of Agriculture and director of the Experiment Station and of Agricultural Extension, succeeding Dean and Director Emeritus J. H. Skinner.

H. G. CHAMPION, of New College, has been appointed professor of forestry to fill the vacancy left at the University of Oxford by the death of Professor R. S. Troup.

DR. WALLACE J. ECKERT, assistant professor of astronomy at Columbia University, has been appointed director of the Nautical Almanac at Washington. He will assume his new duties in February.

DR. HUBLEY R. OWEN, chief surgeon of the medical division of the department of public safety of Philadelphia, has been appointed director of public health, succeeding Dr. Charles F. Nassau.

JEROME STRAUSS, vice-president of the Vanadium Corporation of America, has been elected a member of the Board of Directors of the American Standards Association to succeed Dr. G. W. Thompson, who recently resigned.

THE continuation of the study of bacteriophage at the University of California has been made possible by a grant of $2,430 from the John and Mary R. Markle Foundation, New York City. The research is being conducted by Dr. Albert P. Krueger, professor of bacteriology, who began the study while at the Rockefeller Institute for Medical Research.

THE state secretary of health of Pennsylvania, Dr. John J. Shaw, has announced the appointment of an advisory committee to assist in planning a program of tuberculosis control. Members of the committee are: Drs. Joseph McEldowney, John D. McLean, Louis Cohen, Charles J. Hatfield, Esmond R. Long, Burgess Gordon, Robert G. Torrey and William G. Turnbull, all of Philadelphia; Charles Howard Marcy, Pittsburgh; Charles H. Miner, Wilkesbarre; William Devitt, Allenwood, and John H. Bisbing, Reading.

DR. VANCE B. MURRAY, recently stationed in Berlin, and Dr. Herbert A. Spencer, who has been in Paris, both of the U. S. Public Health Service, have been sent to Finland at the request of the Finnish Red Cross.

J. FRANCIS MACBRIDE, associate curator of the herbarium of the Field Museum, after spending more than ten years in Europe, has returned. After a leave of absence he expects to return to his post at the museum later this year. Since 1929, when he went to Europe, Mr. Macbride has collected photographic negatives of more than 40,000 type specimens of plants, chiefly of South American species, preserved in the principal herbaria of various European countries. He has obtained also from the herbaria in Paris, Madrid, Vienna, Copenhagen and Geneva a large number of herbarium specimens.

DR. L. C. DUNN, professor of zoology at Columbia University, will deliver the fourth Harvey Society Lecture of the current series at the New York Academy of Medicine on January 18. He will speak on "Heredity and the Development of Early Abnormalities in Vertebrates."

DR. LUDVIG HEKTOEN, executive director of the National Advisory Cancer Council of the U. S. Public Health Service, will give the first of two annual Cutter Lectures in Preventive Medicine at the Harvard Medical School on January 15. He will speak on cancer control with special reference to its public health and epidemiologic aspects. Dr. James B. Murphy, of the Rockefeller Institute for Medical Research, New York, will give the second Cutter Lecture on January 22. He will give a critical review of experimental studies in cancer.

DR. WILLIAM ALLEN PUSEY, professor of dermatology emeritus in the College of Medicine of the University of Illinois at Chicago and past president of the American Medical Association, gave on January 9 under the auspices of the Institute of Medicine of Chicago a lecture entitled "High Lights in the History of Chicago Medicine" at a joint meeting of the Chicago Historical Society and the Society of Medical History of Chicago.

AT Cornell University, Dr. William F. Petersen, professor of pathology at the University of Illinois, gave on December 11 a lecture on the Schiff Foundation entitled, "Weather as It Affects Human Behavior." On December 15 Professor L. W. Ploger, of Syracuse University, described his "Experiences with the Seventeenth International Geological Congress in Russia in 1937."

DR. JOHN DEWEY, professor of philosophy emeritus, Columbia University, will give five lectures during the summer session from July 8 to 12 on the educational implications of current philosophical issues as part of a program entitled, "The Arts and Sciences To-day."

DR. HUGO ILTIS, formerly director of the Masaryk Volkshochschule in Brunn, now professor of biology in Mary Washington College at Fredericksburg, Va., proposes to establish there a Mendel Museum. He delivered a lecture on the "Life of Mendel" at Columbia University on December 7.

IN the article on "The Total D-amino Acid Content of Human Tumors and Normal Tissues," which appeared in the issue of SCIENCE for January 5, the name of the third author should be spelled Kabat and not Kabit.

THE annual meeting of the Society of American Bacteriologists, attended by over six hundred members of the society, was held in New Haven, Conn., from December 28 to 30, 1939. This was the fortieth anniversary of the founding of the society in the same city. Several of the charter members were present, and special recognition of the anniversary was made at the annual banquet and in a round-table discussion of the history of bacteriology, with special reference to the Connecticut valley.

A SERIES of lectures on medical care under the De Lamar Foundation of the School of Hygiene and Public Health of the Johns Hopkins University will be held on Tuesday afternoons at five o'clock from January 9 to February 2. The lecturers announced are: Dr. Nathan B. Van Etten, president-elect of the American Medical Association; Dr. E. S. Godfrey, commissioner of health of the State of New York; Dr. I. S. Falk, assistant director of the Federal Security Agency; Dr. R. C. Williams, chief medical officer of the Farm Security Administration; Dr. W. S. Rankin, director of the Hospital and Orphan Section of the Duke Endowment; J. D. Colman, director of the Associated Hospital Services of Baltimore; Dr. Kingsley Roberts, medical director of the Bureau of Cooperative Medicine, and Dr. Nathan Sinai, of the division of hygiene and public health of the University of Michigan.

THE new building for the Hall of Chemistry of the Oregon State College at Corvallis, which houses the laboratories of chemistry, chemical engineering and the department of agricultural chemistry of the Experiment Station, was dedicated on December 2. The building represents an expenditure of $425,000 and has been carried out under the P.W.A. Addresses were made at the scientific sessions by Dr. Linus Pauling, of the California Institute of Technology, and by Dr. Joel H. Hildebrand, of the University of California. The Hon. Willard L. Marks, of the State Board of Higher Education, presided. At the formal dedication the speakers included Governor Charles A. Sprague, Chancellor F. M. Hunter, of the State Board of Higher Education, and President George W. Peavy, of the college, and the Hon. Beatrice W. Sackett.

ORSON C. WELLS, a retired Chicago broker, who died on December 10, has bequeathed the bulk of his estate, said to be worth approximately $2,000,000, to the University of Chicago to found the Orson C. Wells Fund, for medical education and research in connection with the Billings Clinic, a part of the Albert Merritt Billings Hospital of the university. The gift will be used to meet the expenses of the medical work of the clinic. The will also provides for a bequest of $50,000 to the Presbyterian Hospital of Chicago for use in urologic research.

IT is announced that the Armour Institute of Technology and the Lewis Institute, both of Chicago, will be consolidated under the name of the Illinois Institute of Technology. Funds for an annual expenditure of $1,250,000 are available. Including evening institutes and community research services, an attendance of 7,000 was expected. For the present the work will be carried on jointly by the two institutes, but the acquisition of a new site is being considered.

THE Herman Knapp Memorial Eye Hospital of New York City, established seventy years ago, has become affiliated with Columbia Presbyterian Medical Center and Columbia University. The fixtures of the hospital will be moved to the Medical Center, and its activities and the care of out-patients will be resumed at the Medical Center by the Eye Institute and the Vanderbilt Clinic of the Presbyterian Hospital. Its assets will be taken over by Columbia University and will be administered as the Knapp Memorial Foundation in Ophthalmology for graduate study, teaching and research.

THE secretary of the Royal Academy of Italy, according to *Nature*, has announced that the Royal Academy of the Lincei has been amalgamated with the Royal Academy of Italy, which has taken over all the activities of the Lincei. As from July 1, 1939, the publications of the Academy of the Lincei will form part of the combined *Atti della Reale Academia d'Italia*, which will be divided into *Rendiconti* and *Memorie* of the class of moral and historical sciences and of the class of physical, mathematical and natural sciences. The publication of the *Notizie degli Scavi* will be continued without interruption by the Italian Academy. The Royal Academy of Italy will be pleased to send its publications to those institutions which received the publications of the Royal Academy of the Lincei under a system of exchange.

THE Lewis Cass Ledyard, Jr., Fellowship was established in 1939 by a gift from Mrs. Ruth E. Ledyard, wife of the late Lewis Cass Ledyard, Jr., a governor of the New York Hospital. The income, amounting to approximately $4,000 annually, will be awarded to an investigator in the fields of medicine and surgery in any closely related field, applied as follows: $3,000 as a stipend and, approximately, $1,000 for supplies and expenses. Preference will be given to younger applicants who are graduates in medicine and who have demonstrated fitness to carry

on original research of a high order. The research work under this fellowship will be carried on at the New York Hospital and Cornell University Medical College. The fellowship will be available on July 1 at the beginning of the academic year. Applications for the year 1940–41 should be addressed to The Committee of the Lewis Cass Ledyard, Jr., Fellowship, The Society of The New York Hospital, 525 East 68th Street, New York, N. Y., and should be in the hands of the committee by February 15. It is expected that the award will be made by April 1.

SEVERAL grants in support of medical research work have been received recently by the Medical School of the University of Minnesota. A gift of $5,000 has been made by Mrs. John Dwan, of St. Paul, to support the serum center which she had previously started with an endowment. From the John and Mary R. Markle Foundation $1,000 has been granted for work by Dr. Albert V. Stoesser, who is investigating water and electrolyte metabolism in tractable asthma. An annual grant for cancer research, made in the sum of $9,000 three years ago by the Citizens Aid Society of Minneapolis, has been increased to $10,000 a year for the next three-year period. The cancer research is being done by the departments of surgery, pathology and x-ray therapy in University Hospital. Minnesota also has received a fourth fellowship for special graduate training in cancer research from the National Cancer Institute. Another recent grant was that of $16,000 from the Barber Oil Company of Minneapolis to support investigations of the relation of diet and activity to cancer.

DISCUSSION

TWO PARADOXES

IN the archives of the Royal Society there are to be found a number of papers, many of which have never been published, showing that an animated discussion took place in the seventeenth century over the answer to this question: "Is the effect that can be produced by a moving body proportional to the first or to the second power of its velocity?" There were eminent names on both sides of this controversy, the followers of Descartes arguing for the first power, while Leibnitz led the opposition. The discussion was not purely theoretical in character, as each side could cite experimental evidence in support of its contention. An example stated in modern terms will make this clear.

A bullet is fired into a ballistic pendulum. If we focus our attention on the velocity imparted to the pendulum we find this to be proportional to the first power of the velocity of the bullet; but if we regard only the vertical height through which the pendulum is raised, this will be proportional to the second power of the velocity of the bullet.

Simple as this appears to-day, it was a real paradox two centuries ago, for though momentum (or quantity of motion) was a familiar idea to Descartes and Newton, the concepts of work and kinetic energy were yet over a hundred years in the future, and the discussion finally died out without reaching any decision.

It is instructive to note the way in which the nineteenth century finally resolved this paradox. The first step was a clarification of the question and a differentiation of the involved phenomena into two classes—momentum effects and energy effects, the latter class requiring the introduction of a new concept, which was so defined as to be consistent with previously existing mechanical theory. The rather vague ideas of Descartes and of Leibnitz assumed the forms of the conservation of momentum and the conservation of energy.

We have before us to-day a similar paradox dealing with the nature of the electron. Is it a charged particle or a little group of waves? And, as before, there is experimental evidence for both sides of the question. This is well brought out by the diffraction rings obtained by G. P. Thomson,[1] when negative electrons were shot through very thin films of metal. The electron must have a wave aspect, or there would be no interference pattern; it must also have a charged particle aspect, or the whole ring system would not be deflected by a magnet, as it is found to be. Perhaps the solution of this paradox, like that of the seventeenth century, will involve the same elements of clarification, differentiation and the introduction of a new concept.

PAUL R. HEYL
NATIONAL BUREAU OF STANDARDS

OXYGEN RELATIONS IN HYDROPHYTES

IT has been shown by experiments that the roots of willow cuttings obtain oxygen from two separate sources—the atmosphere of the soil and from the shoot.[1] That the roots of herbaceous hydrophytes may also use internal (photosynthetic) oxygen as well as atmospheric oxygen is suggested by certain features of habit and structure.

The root systems of herbaceous hydrophytes are, in a very large number of species, adventitious, arising from some type of underground stem, as rhizomes. Among plants with root systems which are formed

[1] G. P. Thomson, *Proc. Roy. Soc.*, 117: 600, February 1, 1928.
[1] W. A. Cannon, *Plant Physiol.*, 4, 1932.