intervals beginning on September 21, when Dr. Haas will leave San Francisco by clipper. It is expected the commission will operate for about a year.

THE FIFTIETH ANNIVERSARY OF THE UNIVERSITY OF CHICAGO

THE closing events of the celebration of the fiftieth anniversary of the University of Chicago will be held from September 22 to 29. The exercises will center about the subject of "New Features in Education and Research." Details of the program have been printed in the issues of SCIENCE for July 11 and August 15.

Attendance is expected to reach ten thousand. The American Association for the Advancement of Science will meet at the university during the week. Many scientific men from this country and abroad, including many refugee scholars, are expected to be present.

At the anniversary convocation on September 29 President Robert M. Hutchins will make an address and thirty-four honorary degrees will be conferred. The academic festival will end with a luncheon for the visiting delegates of more than four hundred colleges, universities, research institutions and learned societies. Speakers after the luncheon will be President James B. Conant, of Harvard University; President Robert G. Sproul, of the University of California, and President Mildred McAfee, of Wellesley College.

Preceding the special convocation on September 27, President Homer P. Rainey, of the University of Texas, and President Hutchins will speak at the annual alumni assembly; Professor Louis Gottschalk will speak at the Phi Beta Kappa dinner, and official delegates from colleges and universities will attend a reception given by deans of the university.

On Sunday, September 28, an anniversary service of commemoration and thanksgiving will be held in Rockefeller Memorial Chapel, followed by a reception for the delegates given by President and Mrs. Hutchins. President Hutchins will be among the speakers on a special broadcast of the University of Chicago Round Table on the nationwide red network of the National Broadcasting Company at 1:30 P.M. At 8:30 P.M. a special festival concert by the Chicago Symphony Orchestra under the direction of Dr. Frederick Stock will be given in Rockefeller Memorial Chapel.

The festival will follow five days devoted to the meetings of learned societies (September 22 to 26), in which more than a hundred and sixty scientific workers and scholars, including the thirty-four who will be the recipients of honorary degrees, will describe the results of their works.

SYMPOSIA AT THE ATLANTIC CITY MEETING OF THE AMERICAN CHEMICAL SOCIETY

AN extensive program of symposia has been arranged by the various divisions of the American Chemical Society for the Atlantic City meeting, which will be held from September 8 to 12. They are as follows:

Division of Agricultural and Food Chemistry, Gerald A. Fitzgerald, *chairman.* "New Analytical Tools for Biological and Food Research." (Joint symposium with the Divisions of Biological Chemistry and Medicinal Chemistry), G. A. Fitzgerald, presiding.

Division of Biological Chemistry, Herbert O. Calvery, *chairman.* "Physicochemical Methods in Protein Chemistry." (Joint symposium with the Division of Physical and Inorganic Chemistry), D. A. MacInnes, presiding. "The Chemistry of Aging," Anton J. Carlson, presiding. "New Analytical Tools for Biological and Food Research." (Joint symposium with the Division of Agricultural and Food Chemistry and Medicinal Chemistry.)

Division of Chemical Education, R. D. Reed, *chairman.* "Professional Training of Chemists or Chemical Engineers," R. D. Reed, presiding.

Division of Fertilizer Chemistry, H. B. Siems, *chairman.* "Phosphates." (Joint symposium with the Division of Industrial and Engineering Chemistry.)

Division of Industrial and Engineering Chemistry, B. F. Dodge, *chairman.* "Unit Processes," R. Norris Shreve, presiding. "Symposium on Phosphates." (Joint symposium with the Division of Fertilizer Chemistry.) "Electrical Insulation Materials," R. N. Evans, presiding.

Division of Medicinal Chemistry, R. J. Fosbinder, *chairman.* "New Analytical Tools for Biological and Food Research." (Joint symposium with the Divisions of Agricultural and Food Chemistry and Biological Chemistry.)

Division of Paint, Varnish and Plastics Chemistry, G. G. Sward, *chairman.* "Progress in High Polymer Plastics," S. L. Base, presiding.

Division of Physical and Inorganic Chemistry, J. G. Kirkwood, *chairman.* "Physicochemical Methods in Protein Chemistry." (Joint symposium with the Division of Biological Chemistry.) "Magnetism and Molecular Structure," P. W. Selwood, presiding. "Elementary Reactions," F. O. Rice, presiding.

Division of Rubber Chemistry, R. H. Gerke, *chairman.* "Rubber for Defense," R. H. Gerke, presiding.

SCIENTIFIC NOTES AND NEWS

DR. WILLIAM LLOYD EVANS, professor of chemistry and chairman of the department of the Ohio State University, will deliver on September 10 the presidential address before the American Chemical Society meeting at Atlantic City. He will speak on "Some Less Familiar Aspects of Carbohydrate Chemistry."

At the dinner of the society on the evening of the same day an address entitled "The Chemical Warfare Service in National Defense" will be made by Major General William N. Porter, chief of the service. Addresses will be given at the opening meeting on September 8 by H. V. Churchill, of the Aluminum Company of America, on "Industrial Spectrochemical Analysis"; by Dr. B. L. Clarke, of the Bell Telephone Laboratories, on "The Electrographic Method of Analysis," and by V. K. Zworykin and James Hillier, of the RCA Manufacturing Company, on "Applications of the Electron Microscope." At this session presentation will be made of the Priestley Medal to Dr. Thomas Midgley, Jr., whose medal address is entitled "Demonstrations—A Historical Review." Dr. Karl August Folkers will receive the American Chemical Society Award of $1,000 in Pure Chemistry. He will make an address describing his work.

AT the annual meeting of the American Psychological Association, which is being held at Northwestern University on Wednesday, Thursday, Friday and Saturday of the present week, the address of the president, entitled "The Problem of General Quantitative Laws in Psychology," will be given by Dr. Herbert Woodrow, professor of psychology at the University of Illinois. In conjunction with the meeting of the association there are being held meetings of the American Association for Applied Psychology, with Dr. Edgar A. Doll, director of research at the Training School at Vineland, N. J., as president, who will give an address entitled "Scientific Freedom"; of the Society for the Psychological Study of Social Issues, with Dr. Floyd H. Allport, of Harvard University, as chairman, who will speak on "Methods in the Study of Collective Action Phenomena"; and of the Psychometric Society, of which Dr. Jack W. Dunlap, of the University of Rochester, is president, whose address is entitled "The Psychometric Society—Roots and Powers."

THE Baly Medal of the Royal College of Physicians, London, has been awarded to Dr. Edgar Allen, professor of anatomy and chairman of the department at Yale University, in recognition of his work on oestrogens. The Bisset-Hawkins Medal has been conferred on Sir Frederick Menzies for his work as chief medical officer of the London County Council.

THE honorary degree of doctor of science has been conferred by Tufts College on Dr. Charles H. Danforth, professor of anatomy at Stanford University. Dr. Danforth received the A.B. degree from Tufts College in 1908.

DR. SAMUEL M. FEINBERG, Chicago, has been elected an honorary member of the Argentine Society for the Study of Allergy.

DR. GERHARD DOMAGK, professor of morbid anatomy at Münster, who first introduced prontosil, has been made an honorary member of the Spanish Academy of Dermatology and Syphilology.

DR. WILLIAM HARVEY PERKINS, professor of preventive medicine in the School of Medicine of Tulane University, has been appointed dean of Jefferson Medical College, Philadelphia. He succeeds the late Dr. Henry K. Mohler.

DR. JESSE E. HOBSON, of the Westinghouse Electric and Manufacturing Company, has been made director of the department of electrical engineering of the Illinois Institute of Technology at Chicago. The institute was formed last year by the consolidation of the Armour Institute and the Lewis Institute.

ASSISTANT PROFESSOR M. E. ENSMINGER, of the Massachusetts State College, will become head of the department of animal husbandry of the State College of Washington at Pullman.

ANNA M. LUTE, seed analyst for the Colorado Agricultural Experiment Station, retired on September 1.

REAR ADMIRAL W. H. P. BLANDY, who has relieved Rear Admiral W. R. Furlong as chief of the Bureau of Ordnance of the Navy, has been named by the U. S. Navy Department as its representative on the Standards Council of the American Standards Association. Commander Alexander J. Couble, on duty in the Bureau of Ordnance, has relieved Commander F. T. Spellman, and has been named alternate for the chief of the Bureau of Ordnance on the Standards Council.

AT the recent annual meeting of the Woods Hole Oceanographic Institution, Dr. Vannevar Bush, president of the Carnegie Institution of Washington, was elected a trustee to serve until 1944.

DR. G. H. A. CLOWES, research director of the Eli Lilly and Company; Dr. S. C. Brooks, professor of zoology of the University of California at Berkeley, and Columbus Iselin, director of the Oceanographic Institution at Woods Hole, have been elected trustees of the Corporation of the Marine Biological Laboratory at Woods Hole. Dr. W. H. V. Osterhout was elected trustee emeritus.

CARL F. GRAHAM, head of the laboratory of the Procter and Gamble Manufacturing Company, Kansas City, has resigned to become head of the analytical section of the research department of the J. B. Ford Company, Wyandotte, Mich.

DR. H. CH. DYME, of the Kraft Cheese Company, has joined the staff of the Afral Corporation of New York City.

AT Columbia University A. Dejter Hinckley, assistant to the dean of the School of Engineering; Dr.

Charles O. Beckmann, assistant professor of chemistry; James L. Dohr, associate professor of accounting, and Dr. H. W. Farwell, professor of physics, have been appointed members of a committee to coordinate defense training in engineering, science and management.

DR. B. B. FREUD, chairman of the department of chemistry at the Illinois Institute of Technology, has been given a leave of absence for the coming academic year, to serve as colonel. He will be corps area liaison representative with the Sixth Regional Office of Civilian Defense.

SURGEON REAR-ADMIRAL G. GORDON-TAYLOR, vice-president of the Royal College of Surgeons, has been appointed a delegate of the college to attend the thirty-first annual Clinical Congress in Boston, as the guest of the American College of Surgeons.

DR. TRINO CASTRO, director of the Venezuelan Foundation to Combat Infantile Paralysis, arrived in New York on August 27 to attend the American Congress of Physical Therapy to be held in Washington. The foundation in Venezuela, which was recently established, is the first institution of the kind in South America.

DR. RALPH T. ST. JOHN-BROOKS, curator of the National Collection of Type Cultures at the Lister Institute, London, is spending a few months in studying the American Type Culture Collection at Georgetown University. He is investigating several taxonomic problems of joint interest to the two collections.

DR. MELVILLE J. HERSKOVITS sailed for Brazil on August 29, where he will continue his ethnological research during the coming year. The work has been made possible by a grant from the Rockefeller Foundation to Northwestern University. During his absence Dr. William R. Bascom will be acting chairman of the department of anthropology at Northwestern University. Herbert Passim has joined the staff as instructor.

Industrial Standardization reports that Senor Patricio Plante, director of Talleres Metalurgicos at Buenos Aires, vice-president of Iram, the national standardizing body of Argentina, has returned home following a month's stay in the United States. During his visit he conferred at length with the American Standards Association in order to bring about closer cooperation between the two organizations. This cooperation includes an arrangement by which the American Standards Association will circulate standards of the Argentinian body in draft form to secure criticism from interested American industries before their formal adoption. Iram, the largest and oldest standardizing body in Latin America, maintains for the use of Argentinian industries files of all the more important standards of the industrial countries of the world.

AN expedition to various parts of California to collect cryptogamic plants for the herbarium of Field Museum of Natural History recently left Chicago under the direction of Dr. Francis Drouet, curator of cryptogamic botany. Dr. Drouet was accompanied by Donald Richards, of the Hull Botanical Laboratory of the University of Chicago. Collecting will be continued until about the end of October. Several weeks will be spent in the northern mountainous counties, giving special attention to the algae and mosses of the region. A week will be devoted to collecting in the vicinity of San Francisco Bay to secure additional material of the numerous species of microscopic algae described from there in the past. The remainder of the time will be taken up with studies of the algal and moss flora of the San Joaquin and Imperial Valleys in the central and southern parts of the state.

IN the issue of SCIENCE of August 8, page 132, in the note giving an account of an expedition of the American Museum of Natural History, there is reference to a giant rodent which is incorrectly described. A correct account of the discovery of the remains of this rodent from the Oligocene is given in the article by Dr. George Gaylord Simpson, of the American Museum of Natural History, in the issue of SCIENCE for May 16.

NEEDS of the National Defense Program have caused the Civil Service Commission to announce an examination for junior meteorologist in positions paying $2,000 a year. There were not enough eligibles obtained as a result of the written test given under the junior professional assistant examination early this year. Accordingly, applications for a new examination will be accepted until June 30, 1942. The examination will be of the unassembled type—that is, no written test will be given. Applications will be rated as soon as possible after they are received at the commission's Washington office, and those rated eligible will have their names placed on the register set up as a result of the written examination given for the junior meteorologist option of the 1941 junior professional assistant examination. Further information can be obtained from the U. S. Civil Service Commission, Washington, D. C.

THE London *Times* states that German raiders recently set fire to the library of the Moscow Academy of Sciences. The fire was put out, however, before any of the 3,000,000 valuable books in the library were destroyed.

THE Industrial Research Institute, which is affiliated with the National Research Council, will meet in Detroit on September 26 and 27. The Hotel Statler has been designated as headquarters.

DISCUSSION

THE MAGNETIC CURRENT

NOT only electric currents but also magnetic currents flow through the universe.

I reached this conclusion by consecutive and persistent observation of single submicroscopic particles suspended in gases.[1] Using this method in my small condenser I can measure forces of an order of magnitude down to 10^{-10} dynes. Therefore my measurement of forces is more sensitive by the factor of 10^4 than any direct measurements of forces made so far. I was able to find new facts because methods of the highest possible sensitivity were used.

These observations can be summed up in two sentences:

(1) *Particles of matter, irradiated by a concentrated beam of light, move in a homogeneous electric as well as magnetic field in or against the lines of force.* (Electro-photophoresis, magneto-photophoresis). I have therefore concluded that these particles are charged under the impact of light. There exist not only electric but also magnetic charges.

(2) *Particles of the same kind and size move simultaneously toward and against the propagation of the light.* I called the movement away from the light lightpositive and that toward the light lightnegative longitudinal photophoresis.[2] I have therefore concluded that the light beam has potential differences along its propagation which cause the particles on which charges are induced to move in or against the direction of propagation. To the well-known oscillating fields in the beam of light have to be added these stationary electric and magnetic fields.

Before such fundamental conclusions can be drawn one must first see if there is no other explanation possible in accord with existing theories. Working for decades on the experiments and their interpretation I was forced to believe that only such an electromagnetic interpretation can be in accordance with all observable facts.

Heat or mechanical effects—so-called radiometer forces (Crookes)—can not account for these phenomena for the following reasons: There is a photophoretic force in liquids which is of the same order of magnitude as in gases, although no radiometer forces exist in liquids. Silver or copper particles in gases which are reflecting strongly exhibit a tremendous lightnegative movement, though they ought to be most heated on the side toward the light, and one would expect a movement away from the light. It seems impossible to explain the reversibility of the particles with corresponding reversals of the field. The energy of the fields alone is responsible for the orientation of the particles and is a quadratic function of the potentials. One therefore should not expect a change of direction in the motion of uncharged particles if the field is reversed. Were the movement due to heating effects, one could not explain why the particles move across and along the inner part of the beam instead of going entirely out of it. It would also seem strange that the movement of nickel particles under the influence of the geomagnetic field, as it was observed in my institute in Vienna (Austria), could be compensated by a superposed magnetic field of about 0.4 gauss. Furthermore, the movement of the particles always follows the lines of force, no matter from which direction the light may come. This would be impossible if the movement were due to heating effects. That some particles start to move suddenly from rest, that the photophoretic movement suddenly disappears and sometimes increases or decreases gradually, and many other observations can not be explained by mechanical or heat effects.

When I came to the conclusion that there are single magnetic poles (magnetic charges), it was therefore not necessary to ask if this agreed with existing theories, but rather whether there are any experimental facts that contradict it. It can be stated here that so far there are no experimental facts which contradict this conclusion of the existence of single magnetic poles. A study of the literature made with Leo Banet showed the following situation:

It has been the predominating opinion up to the present time that a real quantity of positive or negative electricity can be enclosed within an arbitrarily chosen geometric surface. But no matter how the surface is chosen it will always enclose the same amount of south and north magnetism. In other words, there are true quantities of electricity of either

[1] F. Ehrenhaft, *Annalen der Physik*, 56: 81, 1918; *Philos. Mag.*, 11: 141, 1931; *Annales de Physique*, (Paris) 13: 151, 1940; *Phys. Rev.*, 57: 562 and 659, 1940; *Jour. Franklin Inst.*, 230, 381, 1940; *Nature*, 147: 25, January 4, 1941; F. Ehrenhaft and L. Banet, *Nature*, 147: 297, March 8, 1941; F. Ehrenhaft, *Philosophy of Science*, 8, No. 3, 1941, "The Microcoulomb Experiment" (charges smaller than the electronic charge), see p. 36; F. Ehrenhaft and Leo Banet, *Philosophy of Science*, 8, No. 3, 1941. The older references about photophoresis are given in *Annales de Physique*, 13: 151, 1940.

[2] I have recently constructed the apparatus on which the above-mentioned phenomena can be seen at C. Zeiss Inc., New York. The latest descriptions of the apparatus and of the experiments are given in *Annales de Physique*, 13: 151, 1940.