

the arc light, and, through Baron F. von Pritz Witz-Gaffron, the German Ambassador, also to Professor Walther Nernst, of the University of Berlin. Dr. Brush read a paper on radioactive elements. Dr. Nernst's paper was read by Dr. Irving Langmuir, of the General Electric Company, one of his former pupils. Cresson medals were awarded to Henry Ford "in consideration of his rare inventive ability and power of organization"; to Charles L. Lawrance for his development of the air-cooled motor; Professor Vladimir Karapetoff, of Cornell University, for instruments for the mechanical calculation of magnetic and electrical constants of an electrical transmitting line, and Gustaf W. Elmen, of the Bell Telephone Laboratories, Inc., inventor of permalloy, a new alloy of nickel, 100 times more magnetic than iron.

The Henderson medal was awarded for the first time. It went to William F. Kiesel, in charge of the Altoona shop of the Pennsylvania Railroad, for improvement in locomotives and railroad equipment. Arthur Graham Glasgow, of London, received the Walton Clark medal for improvements in the manufacture of illuminating gas.

William E. Taylor, of Corning, N. Y., received for himself and his associate, Eugene C. Sullivan, the Potts medal for development of pyrex, a heat resisting glass. Oscar G. Thurlow, of the Alabama Power Company, also received the Potts medal for designs and inventions applied to hydroelectric plants.

Other awards were: Longstreth medals to Frank N. Speller, of the National Tube Company, for inventing scale-proof iron pipe, and to Warren P. Valentine, of New York, for improving the refractometer and other optical instruments; Wetherill medals to Albert S. Howell, of the Bell-Howell Company, for the development of movie cameras and projectors adaptable to the amateur, and to Frank E. Ross, of the Yerkes Observatory, for designing wide-angle photographic lenses which increase 100 times the astronomical area that can be photographed; and the Levy medal, to Vannevar Bush, of the Massachusetts Institute of Technology, for two papers on electrical power transmission contributed to the *Journal* of the Franklin Institute.

SCIENTIFIC NOTES AND NEWS

DR. HIDEYO NOGUCHI, member of the Rockefeller Institute for Medical Research, died on May 21 in Africa from yellow fever, which he contracted while working on the disease. Dr. Noguchi was fifty-one years of age.

DR. PERCY E. RAYMOND, associate professor of paleontology at Harvard University, has been awarded the Walker grand prize of \$1,000, offered every five years by the Boston Society of Natural History. The prize, offered for outstanding discoveries or investigations in natural history, went to Professor Raymond for his work on the trilobites.

As already recorded in *SCIENCE*, the Linnean gold medal for 1928 has been awarded by the Linnean Society to Dr. Edmund Beecher Wilson, Da Costa professor of zoology in Columbia University. In commenting on this award, *Nature* says: "Professor Wilson's early work dealt with descriptive embryology; in the 'nineties, he took a great part in founding the new science of experimental embryology, and many of his experiments, especially those on *Amphioxus*, *Nereis*, *Patella* and *Dentalium*, remain classical. He is known to a world-wide circle as the author of that admirable text-book, 'The Cell in Development and Heredity.' First published in 1896, a greatly enlarged third edition appeared in 1925. It is a model of what a text-book should be—encyclopedic, trustworthy and judicial—and shows the hand of a master."

AWARD of prizes for the best contributions to the arc-welding art were made at the opening session of the spring meeting of the American Society of Mechanical Engineers at Pittsburgh on May 14. These prizes were offered by the Lincoln Electric Company, of Cleveland, through its vice-president, James F. Lincoln, with the desire to promote the whole art and to reduce the cost of construction. The first prize, \$10,000, was awarded to James W. Owens, of Newport News, Va., for a paper entitled "Arc Welding, its Fundamentals and Economics." Professor Henri Dustin, of the University of Brussels, Belgium, received the second prize of \$5,000 for his paper on "Fundamental Principles of Arc Welding," while Commander H. E. Rossell, of the U. S. Naval Academy, took the third prize of \$2,500 for his review of "Electric Welding of Ship's Bulkheads and Similar Structures."

SAMUEL REA, of Philadelphia, and Sir Ernest Rutherford, of the University of Cambridge, have, among others, been elected honorary members of the British Institute of Civil Engineers.

ON May 3, at the annual general meeting of the British Iron and Steel Institute, the Bessemer gold medal was presented to Mr. Charles M. Schwab, president of the American Iron and Steel Institute and the president of the Bethlehem Steel Corporation.

DR. DEAN LEWIS, surgeon-in-chief, the Johns Hopkins Hospital, has been made a foreign member of the Società Medico-Chirurgica of Bologna and an Ausserordentliches Mitglied der deutschen Gesellschaft für Chirurgie.

THE annual prize established in honor of Howard Taylor Ricketts, who at the time of his death in 1910 was assistant professor of pathology at the University of Chicago, has been divided between George W. Bachman, of Yochow City, Hunan, China, and James Roy Blayney, of Chicago.

THE council of the British Institution of Civil Engineers has made the following awards for papers read and discussed at the ordinary meetings during the session 1927-28: Telford gold medals to Dr. Oscar Faber, London, and G. L. Watson, Newark, New Jersey. Telford premiums to Professor John Goodman, Skipton; James Williamson, Wallington; R. M. Wynne-Edwards, Vancouver, and jointly to F. C. Vokes, Birmingham, and C. B. Townend, Birmingham.

AT the annual meeting of the Royal Institution on May 1, the Duke of Northumberland was elected *president*, Sir Arthur Keith, *treasurer*, and Sir Robert Robertson, *secretary*.

DR. CARLOS E. PORTER, of Santiago, Chile, editor of the *Revista Chilena di Historia Naturale*, has been elected president of the Entomological Society of Spain.

DR. W. R. BROWNE, assistant professor in the department of geology and physical geography of the University of Sydney, has been elected president of the Linnean Society of New South Wales.

DR. ELMER A. SPERRY, chairman of the board of directors of the Sperry Gyroscope Company, has been nominated for the presidency of the American Society of Mechanical Engineers.

PAUL JOHN KRUESI, president and general manager of the Southern Ferro Alloys Company, has been elected president of the American Electrochemical Society at the annual business meeting held in Bridgeport on April 26.

CARLETON W. STURTEVANT, civil engineer, of New York, has been appointed by President Coolidge to be the civil engineer member of the Mississippi Flood Control Commission, created by the flood control bill.

DR. JOHN P. BUWALDA, professor of geology at the California Institute of Technology, has been appointed a member of a committee of three advisers to assist in the solution of problems confronting the U. S. Department of the Interior in the managing of Yosemite Valley in California.

THE office of chairman of the National Council of Scientific Research for Canada has been accepted by Dr. Henry M. Tory, president of the University of Alberta.

DR. CHARLES BERRY WING, professor of structural engineering at Stanford University, has been appointed director of parks for the state of California.

JOHN P. WENTLING, formerly of the division of forestry in the University of Minnesota, has been appointed director of the research division of the Western Red Cedar Association, with headquarters at Minneapolis.

GEORGE LYNN, formerly physical chemist of the U. S. Bureau of Mines, Helium Division, Pittsburgh, Pennsylvania, has accepted the position of research chemist with the Pittsburgh Plate Glass Company, Barberton, Ohio.

S. C. LANGDON has dropped his teaching work at Northwestern University to take charge of chemical research for Curtis Lighting, Inc., Chicago.

TWO members of the University of California College of Agriculture will be placed on the retired list next July: Dr. Elwood Mead, professor of rural institutions, becomes emeritus professor in that department, and Warren T. Clarke becomes emeritus professor of agricultural extension.

PROFESSOR JOHN W. HARSHBERGER, of the botanical department of the University of Pennsylvania, will visit Algeria, North Africa, this summer, crossing the Atlas Mountains to the northern part of the Sahara Desert to the oases of Biskra, Colomb Bechar and Touggourt. *En route*, he will visit the forests of Atlas cedar. Leaving North Africa, he will proceed *via* Naples, Rome and Leghorn to the Island of Corsica, to acquaint himself with its flora. Homeward-bound, he will cross the French Alps from Nice *en route* to Paris.

DR. A. G. MCCALL, director of soil investigation in the Maryland Agricultural Experiment Station, has arrived in England. He intends to visit the Rothamsted Station at Harpenden, afterward going to the Continent to confer with the chiefs of a number of European experimental stations on the subject of soil investigation.

DR. E. O. ULRICH, associate in stratigraphic paleontology at the U. S. National Museum, left on May 16 for six weeks' field work on the Cambrian and Ozarkian rocks of Oklahoma.

DR. NAGANICHI KURODA, the well-known Japanese ornithologist, visited the division of birds in the U. S. National Museum the last of April. Dr. Kuroda is on his way to Geneva to attend the International Con-

gress for the Protection of Birds. Before his departure from Washington, he was given a dinner by the Baird Club.

DR. E. SCHRATZ, assistant in the Kaiser Wilhelm Institute für Biologie, Berlin, is the recipient of a fellowship from the International Education Board, under the terms of which he will carry on some studies of long-lived cells with Dr. D. T. MacDougal at the Desert Laboratory of the Carnegie Institution of Washington. Dr. Schratz will also be associated with Dr. Forrest Shreve in work on anatomy and distribution of desert plants with reference to lime formations.

PROFESSOR FRIEDRICH HUND, of the University of Rostock, has been appointed lecturer in physics in Harvard University for the second half-year of 1928-1929. Professor Hund will lecture on "Molecular and Atomic Spectra."

THE Massachusetts Institute of Technology announces a ten weeks' course of lectures and laboratory work in colloid chemistry, to be given the coming summer by Ernst A. Hauser, director of the Colloid Laboratory of the German Metallbank und Metallurgische Gesellschaft, Frankfurt.

PROFESSOR ROSS G. HARRISON, of Yale University, delivered a lecture on May 21 at University College, London, on "Modern Trends in the Study of Animal Development."

DR. W. F. G. SWANN, director of the Bartol Research Foundation of the Franklin Institute, addressed the Society of the Sigma Xi on May 4 at the Ohio State University on the subject "The Earth's Electric Charge." The following day he addressed the Central Ohio Physics Club in the Mendenhall Laboratory on "Some Recent Atomic Theories."

DURING a recent visit to the Pennsylvania State College, Dr. Charles A. Shull, professor of plant physiology at the University of Chicago, addressed the honorary agricultural society, Gamma Sigma Delta, on "The Relation of the Fundamental Sciences to the Agricultural Experiment Stations," and the Penn State Science Club on "The Life and Work of Stephen Hales."

DR. W. J. HUMPHREYS, of the U. S. Weather Bureau, gave an illustrated lecture on "Clouds and Cloud Splendors" before the New York Academy of Sciences on the evening of May 7.

PROFESSOR F. R. WATSON, of the University of Illinois, gave an address on May 17 on "Ideal Auditorium Acoustics" at the annual convention of the American Institute of Architects.

ON May 3, Dr. Maude Slye, of the University of Chicago, spoke at Iowa State College on her work concerning cancer and heredity.

SIR FRANK DYSON, astronomer royal, delivered his presidential address to the British Institute of Physics on May 15, taking as his subject "Physics in Astronomy."

THE Romanes lecture for 1928 was given in the Sheldonian Theater, London, on May 4 by Professor D. M. S. Watson, Jodrell professor of zoology and comparative anatomy in the University of London. Professor Watson took as his subject "The Paleontology and the Evolution of Man."

DR. CHARLES H. GILBERT, professor of zoology at Stanford University, died on April 20, aged sixty-eight years.

FELIX DEUTSCHE, president of the Allgemeine Elektrizitätsgesellschaft and one of Germany's foremost industrialists, died on May 19, aged seventy years.

THE Louisiana Academy of Sciences, which was organized at Centenary College on March 5, 1927, held its first annual meeting at Louisiana College, Pineville, Louisiana, on May 5, under the presidency of Professor I. Maizlish, of Centenary College. Dr. H. A. Wilson, professor of physics at the Rice Institute, gave the principal address. His subject was "Recent Theories of Atomic Structure." It was voted that the next annual meeting shall be held at the Southwestern Louisiana Institute, Lafayette, Louisiana.

THE American Dairy Science Association will hold its annual meeting at the University of Wisconsin, from June 26 to 28 inclusive. The meeting will bring together research workers, agricultural extension agents, breeders and representatives of large milk plants, butter, cheese and ice cream manufacturers. Dairying in the broadest sense will be discussed from many different angles. Plans are being made for a number of demonstrations, inspection visits and conferences in some of the principal dairy centers of the state. It is expected that every agricultural experiment station and every agricultural school in the United States will be represented.

Two congresses of mathematicians have been held since the war; at Strasbourg in 1920, and at Toronto in 1924. It is proposed to hold a congress at Bologna in 1929, at which delegates from Central Europe will be present for the first time. M. Mussolini has agreed to act as honorary president and Professor Pasquale Sfamini as president. The executive committee is being organized by Professor Salvatore Pincherle, and

the general secretariat by Professor Ettore Bartolotti. It is proposed to organize various sections, including pure mathematics, and mathematics applied to economic, scientific and technical problems. Members of the congress will be invited to make excursions to Florence and Ravenna.

IN celebration of the fiftieth anniversary of the foundation of the Folk-Lore Society, which was established in January, 1878, it has been decided to hold a Folk-Lore Congress in London from September 19 to 25. An advisory council is being formed to promote the congress, which is intended to be international in character. Many papers have already been promised, and it is proposed to include in the program exhibits and performances of folk-lore interest, visits to museums, etc. The subscription to the congress has been fixed at 10s. 6d. for members living in Great Britain, and at 7s. 6d. for those living abroad.

THE council of the Royal Geographical Society has received a radio message from Captain Wilkins thanking them for the award of the Patron's medal, and offering for the museum of the society the small British flag which he has carried through more than 15,000 miles of Arctic flying. The council accepted this gift, which will be placed beside the Union Jack flown by Sir Edward Parry on his sledge journey to latitude 82° 45' North a century before. Captain Wilkins will be present to receive his medal at the anniversary meeting on June 18, and it is expected that both he and Lieutenant Eielson will be guests of the society at the anniversary dinner the same evening.

TWENTY-THREE honor graduates of British institutions of learning have received Commonwealth Fund Fellowships* for study in the United States, including the following in the fields of science: Cyril D. Forde, University College, London; cultural history of North America from geographical and anthropological viewpoint, at the University of California. George A. Cumming, St. Andrews; geology, especially structure and stratigraphy, at the California Institute of Technology. Robert Spence, Armstrong College, Durham; physical chemistry, at Princeton University. Robert H. Angus, Sidney Sussex College, Cambridge; protection of high voltage and electric traction systems, at Stanford University. John M. Robertson, Glasgow; organic chemistry, at the University of Michigan. Norman Peter Inglis, Liverpool; strength of materials and fatigue of metals, at the University of Illinois. Catharine C. Steele, St. Andrews; organic chemistry with reference to optical activity, at the University of Illinois.

THE House on May 12 passed a bill designed to insure adequate supplies of timber by providing a 10-year program of reforestation. The bill sets up a

series of authorizations covering the activities of the forest experiment stations. The House amended the Senate bill in passing it by providing for the establishment of additional forest experiment stations in Alaska and Hawaii and one additional station in a southern state. It is contemplated that appropriations under all the sections of the bill will approach the maximum authorizations under each section by approximately equal increases over the 10-year period until the maximum amount authorized, \$3,575,000, is reached.

AT Ohio State University this spring a gold medal will be awarded for the first time from the Lamme Foundation, of which the late Benjamin Garver Lamme, who was chief engineer of the Westinghouse Electric and Manufacturing Company, is the donor. The medal, which contains \$100 worth of gold, is to be awarded every five years to a graduate in any branch of engineering at Ohio State University.

COLONEL CHARLES LINDBERGH took his airplane, "Spirit of St. Louis," to Washington on April 30 for the purpose of turning it over to the Smithsonian Institution. The machine is to be exhibited in the Arts and Industries Building of the U. S. National Museum and plans have been made for suspending it just inside the main entrance. Approaches from galleries on either side will make it possible for visitors to see the interior of the cockpit at close range.

THE will of the late Harmon W. Hendricks, of New York, leaves \$250,000 to the Museum of the American Indian, of which he was vice-president.

A TOTAL of \$175,000 has been raised toward the building fund of the San Diego Natural History Museum. The total amount sought is \$250,000.

ACCORDING to *Museum News*, the first arboretum in West Virginia will be established at Wheeling. It will cover an area of approximately 70 acres and will include several miles of trails, along which signs and labels will be placed to instruct visitors in natural history.

THE discovery of basket maker remains in cave shelters in southern New Mexico near Las Cruces, and in southwestern Texas in the vicinity of El Paso is the most important result of the Peabody Museum's Southwestern expedition of 1927 under direction of Mr. C. B. Cosgrove. Specimens recovered included the spear thrower or atlatl, long light darts with stone-tipped foreshafts, twined-woven bags, containers made from the skins of small mammals and other objects characteristic of the classic basket maker (Basket Maker II) culture, the earliest agricultural group in the Southwest. The find serves to extend southward by several hundred miles the known range of this very ancient people.

Two research fellowships in organic chemistry carrying a salary of \$2,000 each a year have been organized for the coming year in the Sterling Chemistry Laboratory of Yale University. They will be known as the Milton Campbell research fellowships in organic chemistry and will be open only to men who have received their Ph.D. degree. Application for these fellowships with complete credentials should be directed to Professor Treat B. Johnson. A graduate fellowship in organic chemistry has been tendered to the Sterling Chemistry Laboratory by the Eli Lilly Laboratories for the year 1928-29. It has been awarded to Mr. Robert M. Herbst.

A census of the scientific workers of the Soviet Union has been taken by the Russian Academy of Sciences. There are altogether about 26,000 scientific workers active in the U. S. S. R., of which 12,000 are living in Leningrad and Moscow. A reference book on the scientific institutions of the U. S. S. R. is being issued by the academy.

DR. J. McKEEN CATTELL, editor of *SCIENCE*, sails for Europe on May 26, returning on August 5. During this interval editorial communications should be addressed to Dr. McKen Cattell, whose address is Garrison, N. Y.

UNIVERSITY AND EDUCATIONAL NOTES

COLTON LABORATORY, built and equipped to care for the departments of physics, chemistry and biology at Hiram College, was dedicated May 12. The building consists of three stories over a full basement and is constructed of concrete, brick and stone. It is named in honor of Professor George H. Colton, who was a teacher of the sciences at Hiram College from 1873 to 1926. Addresses were made by Dr. H. C. Cowles, Dr. Harry N. Holmes and Dr. H. B. Lemon, representing, respectively, botany, chemistry and physics.

THE departments of mathematics and physics of Princeton University have announced the following special program of graduate courses and lectures during the coming academic year in the field of recent developments in mathematical physics: Professor H. Weyl will lecture on "Group Theory and Quantum Mechanics." He will be assisted by Dr. H. P. Robertson, visiting assistant professor from the California Institute of Technology. Professors Eisenhart and Robertson will offer a course in "The Mathematics of the Newer Quantum Theory." Professor E. U. Condon will give a course in "Wave Mechanics," with special emphasis on the physical concepts and applications.

DR. JAMES I. SCARBOROUGH has been appointed head of the department of surgery at the University of Arkansas, to assume his new duties on September 15.

DR. LEE WALLACE DEAN, formerly of the University of Iowa, has been appointed full-time professor of oto-laryngology in the Washington University School of Medicine. Dr. Dean will assume his duties immediately.

THE recent promotion of Dr. Selig Hecht to a full professorship of biophysics in Columbia University was incorrectly reported in *SCIENCE* as being in the department of biochemistry.

DR. J. C. GEIGER, for five years connected with the faculty of the University of Chicago, has arrived at the University of California to accept an appointment as associate professor of epidemiology in the medical school and Hooper Foundation for Medical Research.

DR. M. T. TOWNSEND, of St. John's College, Md., has been appointed associate professor of histology and embryology in the medical school at the University of Oklahoma.

MISS HOPE HIBBARD, fellow in the International Education Board, at present in Paris, has been appointed assistant professor of zoology at Oberlin College.

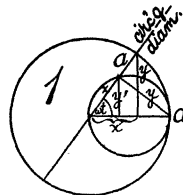
DR. W. W. JAMESON has been appointed to the chair of public health at the University of London, tenable at the London School of Hygiene and Tropical Medicine.

DR. HERMANN SIERP, professor of botany in the University of Munich, has been appointed to the chair of botany in the University of Köln.

DISCUSSION AND CORRESPONDENCE

THE LITTLE CIRCLE OF REFERENCE

ONE usually defines a simple harmonic motion as the motion of the projection of a uniformly circulating point on a fixed diameter. It may sometimes with advantage be defined as the motion of the projection of a fixed circumferential point on a uniformly circulating diameter, relatively to that diameter. In figure 1



the two y 's and the two x 's are obviously the same, the angular displacement of the diameter at t seconds being ωt . The foot point from a lies on what may be called the little circle of reference; and since $x =$