end of the year, and (c) that a report on the work has not been previously announced and described before a scientific body or previously published. It is desirable, but not necessary, that those planning to work for the award send to the council before March 1, 1943, a statement of such intention. A report of the work and resulting conclusions must be submitted to the Research Council on Problems of Alcohol on or before February 15, 1944.

The Committee of Award will consist of five members—an officer of the American Association for the Advancement of Science, and four representatives of the Scientific Committee of the Research Council on Problems of Alcohol.

If the committee is not convinced of the outstanding merit of the research done during 1943, as described in reports submitted, it may, at its discretion, postpone the award for another year, or until such time as work of such merit has been performed.

THE NEW YORK MEETING OF THE OPTICAL SOCIETY OF AMERICA

THE mid-winter meeting of the Optical Society of America will be held at the Hotel Pennsylvania in New York, N. Y., on March 5 and 6. The Inter-Society Color Council will meet on Thursday, March 4, for a discussion in the morning and a business session in the afternoon. On Friday morning, March 5, there will be held a symposium of invited papers on "Vision" as follows:

"Factors in Human Visual Resolution," by Gordon L. Walls, Bausch and Lomb Optical Company.

"Some Physiological Aspects of the Eye as an Image-Forming Mechanism," by Kenneth N. Ogle, Dartmouth Eye Institute.

"Dark Adaption: Some Physical, Physiological and Clinical Considerations," by Charles Sheard, The Mayo Foundation.

"Some Factors and Implications of Color Constancy," by Harry Helson, Bryn Mawr College and The Foxboro Company.

An informal dinner will take place in the evening, followed by a lecture on "Visual Processes and Color Photography" by Ralph M. Evans, of the Eastman Kodak Company.

A second symposium on "Color-Blindness and Color-Blindness Tests" (arranged by the Inter-Society Color Council) will be held in the morning of March 6. The subjects of the papers and the authors are:

"Facts of Color-Blindness," by Deane B. Judd, National Bureau of Standards.

"Methodology of Test Preparation," by Forrest Lee Dimmick, Hobart College.

"The Evolution of Color Vision Tests," by Elsie Murray, Cornell University.

"The Red-Green-and-Yellow Equation for Normal and Color-Blind Observers," by Selig Hecht, Simon Schlaar and James C. Peskin, Columbia University.

"Hue Discrimination Test for Anomalous Color Vision," by David L. MacAdam, Eastman Kodak Company.

"A Method of Testing Color Vision Using Colored Transparencies and Standard Conditions of Observation," by Frederick W. Jobe, Bausch and Lomb Optical Company.

"The Farnsworth-Munsell 100-hue and Dichotomous Tests for Color Vision," by Dean Farnsworth, New York University.

"The ISCC Single Judgment Test for Red-Green Discrimination," by LeGrand H. Hardy, Institute of Ophthalmology.

Contributed papers will be presented in the afternoons of both days.

ELEMENT NO. 85

RECENT press dispatches from Bern, Switzerland, report the identification of element 85 as a disintegration product of radium. The work was done by Dr. Walter Minder, director of the Radium Institute at Bern, and Dr. Alice Leigh-Smith, an English expert in nuclear physics who has been studying cancer at the institute. Among the disintegration products of radium, these workers found traces of a compound which appeared to contain a radioactive form of element 85. Their recent work has succeeded in increasing the amount available, and now the announcement is made of the photographic identification of the element. The name anglo-helvetium is proposed in honor of England and Switzerland.

It will be recalled that the discovery of element 85 was announced in 1931 by Professor Fred Allison, of the Alabama Polytechnic Institute. By using the magneto-optic apparatus he found traces of the element, which he named alabamine, in sea water, in samples of potassium bromide and in such minerals as kainite, apatite and fluorite.

SCIENTIFIC NOTES AND NEWS

DR. A. W. HULL, of the General Electric Company, has been elected president of the American Physical Society in succession to Dr. P. W. Bridgman, Hollis professor of mathematics and natural philosophy at Harvard University. Other officers elected were Dr. Arthur J. Dempster, of the University of Chicago, *vice-president;* Dr. Karl K. Darrow, of the Bell Telephone Laboratories, *secretary,* and Dr. George B. Pegram, of Columbia University, *treasurer.*

PROFESSOR G. W. STEWART, of the State University

of Iowa, was presented with the Oersted Medal at the New York meeting of the American Association of Physics Teachers, which was held in conjunction with the American Physical Society. The medal is given for eminence as a physics teacher.

THE Robert M. Losey Award of the Institute of Aeronautical Sciences has been conferred on Commander F. W. Reichelderfer, chief of the U. S. Weather Bureau, "in recognition of his outstanding contributions to the science of meteorology as applied to aeronautics."

IN a recent issue of SCIENCE there was a note stating that Dr. Eugene L. Opie had returned to Cornell University Medical College to take charge, in the absence of Dr. William Dock, who recently entered the Army, of the work of the department of pathology. Dr. Opie is devoting part time also to the Henry Phipps Institute, Philadelphia, as temporary director of the laboratories.

A VICTORY ship of the California Shipbuilding Corporation has been given the name of George E. Hale, the distinguished astronomer who died in 1938.

DONALD BERTRAND TRESIDDER, M.D., president of the Board of Trustees and an alumnus of Stanford University, has been appointed to succeed Dr. Ray Lyman Wilbur, who was elected president in 1916. Since June, 1941, Dr. Wilbur has been chancellor and acting president of the university.

DR. GAYLORD P. WHITLOCK, who received the Ph.D. degree in agricultural and biological chemistry at the Pennsylvania State College in December, 1942, has joined the research staff of the department of dairy industry at the Iowa State College at Ames.

DR. MARGARET H. FULFORD, assistant professor of botany at the University of Cincinnati, has been appointed the recipient of a summer fellowship established for one year through a gift of Mrs. Elon Huntington Hooker. The fellowship was given to perpetuate the memory and work of Dr. Marshall A. Howe, who was for thirty-five years a member of the staff of the New York Botanical Garden and for the last two years of his life its director.

DEAN IVAN C. CRAWFORD, of the College of Engineering of the University of Michigan, has been named technical adviser and consultant to the Training Division of the U. S. Navy. Dean Crawford's services are being loaned to the Navy. He will return to the university a few days each month to carry on his administrative work in the College of Engineering.

DR. E. E. NAYLOR, assistant professor of botany at the University of Missouri, has become a technical assistant on the staff of the New York Botanical Garden.

GLENN L. MARTIN, president of Glenn L. Martin Company, has been elected president of the Aircraft War Production Council. He succeeds Guy W. Vaughan, head of Curtiss-Wright Corporation.

S. CAPLAN, who for the past nine years has been associated as research chemist with the Harvel Research Corporation, has become the research manager and acting technical director of the Irvington Varnish and Insulator Company at Irvington, N. J. He succeeds C. F. Hanson, who has been appointed chief consulting engineer. He will be responsible for expediting technical work on war production.

DR. MAURICE L. TAINTER, professor of pharmacology at the Stanford University School of Medicine, has been named state gas officer for California by the State Council of Defense Emergency Medical Service. Dr. Tainter set up San Francisco's gas treatment and protection services for civilian defense.

DR. HAROLD T. COOK, plant pathologist at the Virginia Truck Experiment Station, Norfolk, Va., has been commissioned Lieutenant in the Navy Reserves.

DR. WILLIAM B. HERMS, professor of parasitology and head of the Division of Entomology and Parasitology of the University of California, has been called to active duty by the War Department as Lieutenant-Colonel in the Sanitary Corps. He has been a Reserve Officer since 1924 and has been called for duty at the Army Medical Field Service School, Carlisle Barracks, Pennsylvania. He will be instructor in tropical medicine, having specialized in work on malaria, typhus fever and other diseases of the tropics. Professor E. O. Essig, professor of entomology, will act as head of the division during Professor Herms's absence.

DR. J. STANLEY GARDINER, F.R.S., emeritus professor of zoology at the University of Cambridge, has been appointed a member of the British Standing Commission on Museums and Galleries in the room of the late Sir Henry Miers, F.R.S.

ROBERT RAE, professor of agriculture at the University of Reading, England, and joint director of the Agricultural Research Institute at Hillsborough, Ireland, is visiting the United States. He will make a study of agricultural colleges and field organizations.

JOHN H. PIERCE left New York on January 12 on a wartime assignment to Colombia, Venezuela and Brazil for the Pan-American Products Corporation. He will collect and make a survey of certain plant products that are needed in war production.

THE sixth Christian Fenger Lecture of the Institute of Medicine of Chicago and the Chicago Pathological Society will be delivered on February 8 by Dr. William H. Taliaferro, Eliakim Hastings Moore distin-

guished service professor of parasitology and dean of the Division of Biological Sciences of the University of Chicago. He will speak on "Antigen-Antibody Mechanisms in Immunity to Metazoan Parasites."

DR. O. D. VON ENGELN, professor of geology at Cornell University, gave the Bownocker lectures of the department of geology at the Ohio State University on the afternoons of January 21 and 22. He also addressed the Ohio State Chapter of the Society of Sigma Xi on the evening of January 21. The subjects for the afternoon lectures were "The Nature of Glaciers" and "Two Schools of Geomorphology." The subject for the evening lecture was "Terrain and War."

DR. JOHN L. RICE, president of the American Public Health Association for 1942 and formerly commissioner of health of New York City, has joined the staff of Lederle Laboratories as consultant.

PROFESSOR CARL G. HARTMAN, of the department of zoology of the University of Illinois, spoke on January 13 at Iowa State College on "Instinctive Behavior."

AS announced last year two symposia are being organized by the American Physiological Society: "Special Senses in Relation to War Problems" by Dr. Hallowell Davis and "Physiological Aspects of Fitness in Relation to War Problems" by Dr. Maurice B. Visscher. These will be published in the second and third numbers of "Federation Proceedings" with similar material from other societies. It is not planned to have them orally presented at any regional meeting.

THE Johns Hopkins Medical History Club will hold its second meeting of the year on Monday, February 1, at 8:30 P.M., in the Institute of the History of Medicine. A paper on "Superstition and Medical Progress" will be given by Dr. E. B. Krumbhaar, of the University of Pennsylvania, and one on the "History of our Knowledge of the Lymphatic Vessels," by Dr. George W. Corner, of the department of embryology, Baltimore, of the Carnegie Institution of Washington.

THE next meeting of the trustees of the Elizabeth Thompson Science Fund will be held in April. Previous awards from the fund were reported in SCIENCE on June 19 and earlier. Applications for grants should be made to the Secretary, Dr. Jeffries Wyman, Biological Laboratories, Harvard University, Cambridge, Mass.

THE Supreme Court on January 18 upheld the conviction of the American Medical Association and its affiliated Medical Society of the District of Columbia on charges of seeking to restrain the operations of the Group Health Association, Inc., a Washington medical service cooperative, in violation of the Sherman anti-trust law forbidding restraint of trade. The indictments accused the two medical organizations of seeking to restrain the cooperative in supplying—through monthly salaried full-time employee doctors—medical care to its members and their dependents; to restrain members of the Group Health Association from obtaining such medical care; to restrain Group Health Association doctors; to restrain other doctors in the pursuit of their calling and, finally, to restrain Washington hospitals.

A NEW editorial board has been announced for *Endocrinology,* its members being J. S. L. Browne, department of medicine, McGill University; E. T. Engle, College of Physicians and Surgeons, Columbia University; Carl G. Hartman, department of zoology, University of Illinois; E. C. Kendall, Division of Biochemistry, Mayo Clinic; F. C. Koch, department of biochemistry, University of Chicago; C. N. H. Long, department of physical chemistry, Yale University School of Medicine, and H. B. van Dyke, Squibb Institute for Medical Research. The managing editor is E. B. Astwood, of the departments of medicine and pharmacology, Harvard Medical School, and the associate managing editor, E. W. Dempsey, of the department of anatomy also of Harvard Medical School. A statement of new policies for the journal appears in the February issue of *Endocrinology.*

A RESEARCH fellowship in the department of chemistry at Lehigh University has been established by the West Vaco Chlorine Products Corporation to support research into the uses of active magnesia particularly as a catalytic agent. The grant, which carries a monthly stipend to the student of $60, has been guaranteed for two years and begins with the new semester on February 1. The work will be under the direction of Dr. Albert C. Zettlemoyer, instructor in physical chemistry.

THE J. T. Baker Chemical Company has announced that its Eastern Fellowship for Research in Analytical Chemistry is open for 1943–44. The object of this fellowship is to encourage and to assist fundamental research in analytical chemistry. The recipient will receive $1,000 annually and will be expected to devote at least nine months to research in an institution conferring the Ph.D. or Sc.D. degree in chemistry in New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia or one of the New England States. The fellowship is awarded by a committee consisting of N. H. Furman, *chairman,* Princeton University; J. H. Yoe, *secretary,* University of Virginia; G. P. Baxter, Harvard University; H. A. Fales, Columbia University, and M. L. Nichols, Cornell University. A candidate for this fellowship must

possess a bachelor's degree or its equivalent and a broad training in the fundamental branches of chemistry. Applications should be sent to John H. Yoe, University of Virginia, Charlottesville, Va., not later than March 1. Further details will be furnished upon request.

THE London correspondent of the *Journal* of the American Medical Association writes: "The war has cut off the Scandinavian sources of material for making paper, and the supply of paper for the printing of periodicals and books is controlled by the government. The result is enforced economy in the consumption of paper. The first June issue of *The British Medical Journal* in 1941 contained only thirty-eight reading pages; in the corresponding issue of 1942 the number was reduced to thirty-two because the paper controller continues to cut the supply. Hence *The British Medical Journal* has made a further reduction in the size of the type and reduced the considerable space given to correspondence, and has enjoined conciseness on correspondents."

ATTENTION is called in a note printed in *Nature* to the extensive facilities available at the Imperial Institute, London, for the rapid supply of technical information relating to the trade, occurrence and utilization throughout the world of all kinds of raw materials, and the scope of the intelligence service is not so well known as they should be. The institute's staff includes tropical agriculturists, chemists, chemical technologists, economic botanists, economic geologists, mining engineers, mineralogists and statisticians, and, when desirable, the institute seeks the advice of members of its fifteen consultative committees. Further help is also afforded by numerous trade contacts. The institute also has an extensive reference library and a technical index covering most of the relevant trade and scientific publications issued during the past thirty years. The institute can deal with inquiries relating to sources of supply of, and other information relating to, raw materials and semi-manufactured products whether of animal, plant or mineral origin in all countries, cultivation of crops and the soil and conditions under which they have to be grown, methods employed in mining, smelting and dressing minerals for the market, and so on. Analysis and testing of samples of raw materials is undertaken in the laboratories of the institute. Inquiries should be made in the first instance to the Intelligence Section of the Plant and Animal Products Department or of the Mineral Resources Department, according to the nature of the subject concerned. No charge is made for services to departments of the United Kingdom Government or other Governments of the Empire contributing to the general funds of the institute unless a particular inquiry involves a volume of work so great that it can not be undertaken by the existing staff.

DISCUSSION

EFFECTS OF THE EARTH'S ROTATION ON THE RANGE AND DRIFT OF A PROJECTILE

THERE has been much discussion recently concerning the question: Does a projectile (or missile) move farther when fired to the east than when fired to the west? Some authors contend that the two distances traversed are the same, others that the distance to the east is greater than that to the west, and still others that the distance to the west is greater than that to the east.

Under the proper restriction each of these statements is correct. For, as we shall show below, if the angle of elevation of the gun were *just* 60° the two distances would be the same; if it were between 0° and 60° the distance to the east would be greater than that to the west, and finally if this angle were between 60° and 90° the distance to the west would be greater than that to the east.

In order to prove this, use will be made of some of the formulae which have already been derived by the author in his monograph entitled, "The Weight Field of Force of the Earth," published in Washington University Studies, New Series, Science and Technology, No. 11, 1940.

1st Proof: By a simple trigonometric transformation the second of formulae (129) on page 68 the range x of a projectile may be expressed in the form

$$\bar{x} = \frac{v_0^2}{g_1}\sin 2\beta + \Delta\bar{x}, \tag{1}$$

where

$$\Delta\bar{x} = -\frac{4 v_0^3}{3 g_1^2}\omega \cos\phi_1 \sin 3\beta \sin\alpha,$$

in which ω is the angular velocity of the earth's rotation with respect to the fixed stars, g_1 is the acceleration, due to weight, at the position of the gun, ϕ_1 is the astronomical latitude at the position of the gun, α is the azimuth (measured from the south through the west) of the direction of fire (*i.e.*, of the positive sense of the axis of x), β is the angle of elevation of the gun (measured upward from the direction of fire), v_0 is the muzzle velocity of the projectile. The ranges in value of the various angles are:

$$-90° < \phi_1 < 90°, \qquad 0° \leqq \alpha < 360°, \qquad 0° < \beta < 90°.$$

If the projectile be fired to the east, for which $\alpha = 270°$ or $\sin\alpha = -1$, we have, in particular,