didates and the importance of their work in their particular field.

This statement of the conditions under which these awards have been made will be a sufficient indication of the severity of the scrutiny under which the work of the two present recipients has passed and of the high order of merit which must have been put in evidence in order that they should have been selected from this wide field of choice.

And now it becomes my very pleasant duty to announce the award of the Sigma Xi Semi-Centennial Research Prize of one thousand dollars for work in the biological sciences to Dr. Richard E. Shope, of the Rockefeller Institute for Medical Research, Princeton, N. J., for the work he has done on the etiology of swine influenza—particularly for determining the dual nature of this disease, and thus establishing a principle which it is believed will have wide application in the control of infective diseases.

Dr. Shope was born in Des Moines, Ia., December 25, 1901. He received his M.D. degree at Iowa University in 1924. He was instructor in pharmacology and materia medica in the College of Medicine at the University of Ohio for one year, and has been at Rockefeller Institute since 1925. His particular work has been in the field of animal pathology and filterable viruses.

Dr. Shope, it affords me very great pleasure, on behalf of Sigma Xi, to hand to you the substantial evidence of this award and to wish for you a long and fruitful life in the further pursuit of scientific research in your chosen field.

The Sigma Xi Semi-Centennial Research Prize of one thousand dollars for work in the physical sciences is awarded to Professor I. I. Rabi, of Columbia University, for work which he has done on molecular beams, and particularly on the magnetic moments of the proton and deuteron, and because of the promise that this work holds for the future.

Dr. Rabi was born in Rymanow, July 29, 1898. He received his Ph.D. at Columbia in 1927. He was a fellow in physics at Columbia for one year, and has been assistant professor of physics at Columbia since 1930. His specialty has been in magnetism and quantum mechanics, and particularly in molecular beams.

And now, Dr. Rabi, it affords me very great pleasure, on behalf of Sigma Xi, to hand to you the substantial evidence of this award and to wish for you, too, a long and fruitful life in the future pursuit of scientific research in your chosen field.

SCIENTIFIC NOTES AND NEWS

AT the commencement exercises of Harvard University the doctorate of laws was conferred on Dr. Isaiah Bowman and the doctorate of science on Dr. Elmer Drew Merrill and on Dr. Frank Baldwin Jewett. The citations were as follows: Isaiah Bowman, president of the Johns Hopkins University—"A distinguished geographer who maps with a bold and steady hand the future of an illustrious university." Elmer Drew Merrill, professor of botany and administrator of botanical collections at Harvard University—"A botanist famed for his investigations of the flora of the Philippines, an administrator marked by his effectiveness in many posts." Frank Baldwin Jewett, electrical engineer, president of the Bell Telephone Laboratories since 1925—"The creator of a famous laboratory whence came miracles of modern telephony, an engineer who points the way for industry to follow."

IN presenting Dr. E. P. Hubble for the degree of doctor of science at Princeton University, Dr. Luther P. Eisenhart, dean of the Graduate School, made the following citation: "Edwin Powell Hubble, staff member of the Mount Wilson Observatory; graduate of the University of Chicago and of Oxford, as a Rhodes scholar; member of the National Academy of Sciences and Astronomical Societies in this country and abroad; by an extensive, well-planned campaign of observation and unusual insight in interpretation he has supplied the first real understanding of the nature of the nebulae, showing that the diffuse nebulae are clouds of dust or gas in our galaxy, and that the spiral and elliptical white nebulae are swarms of stars, external to our galaxy, receding with enormous velocities and millions of light years distant; a Ulysses embarked with his telescope upon a great adventure in our expanding universe, seeking knowledge 'beyond the utmost bound of human thought.'"

DR. THOMAS BARBOUR, director of the Museum of Comparative Zoology of Harvard University, received on June 15 the honorary degree of doctor of science from Dartmouth College.

COLBY COLLEGE conferred on June 15 the honorary degree of doctor of laws, posthumously, on the late John Hays Hammond, mining engineer. Dr. Hammond, who died on June 8, was to have been a speaker at the one hundred and fifteenth commencement dinner.

THE honorary doctorate of laws was conferred on June 3 by the University of Toronto on Dr. George F. Kay, who for twenty years has been dean of the College of Liberal Arts of the State University of Iowa and who for more than twenty years was head of the department of geology and director of the Iowa Geological Survey. Dr. Kay graduated from the University of Toronto in the year 1900.

AT Lehigh University two honorary degrees were conferred. The recipients were Stephen Timoshenko, professor of engineering mechanics at the University of Michigan, and Alexander Potter, consulting engineer, of New York City.

THE degree of doctor of science was conferred on June 24 by the University of Oxford on Dr. Edgar Douglas Adrian, fellow of Trinity College, Cambridge, Foulerton professor of the Royal Society, London.

Nature reports that at a recent meeting of the Quekett Microscopical Club, Sir David Prain was elected an honorary member. Sir David was director of the Botanical Survey of India and superintendent of the Royal Botanic Gardens, Calcutta, from 1896 to 1905 and director of the Royal Botanic Gardens, Kew, from 1905 to 1922.

DR. SIMON FLEXNER, member emeritus of the Rockefeller Institute for Medical Research, was elected an honorary fellow of the Royal Society of Medicine at the meeting held in London on May 19.

DR. ROGER JOHN WILLIAMS, professor of chemistry at Oregon State College, in recognition of his work on vitamins has been presented with the scroll given annually by the University of Oregon Chapter of Sigma Xi to an "outstanding man of science in Oregon."

RALPH W. HAYES, head of the Department of Forestry of the Louisiana State University, was elected president of the Gulf States Foresters at the recent meeting of the association in Bogalusa. A. D. Folweiler, also of the Louisiana State University, was named secretary-treasurer and L. L. Bishop, of Texas, vice-chairman.

HOWARD W. BLAKESLEE, science editor of the Associated Press, has been elected president of the National Association of Science Writers.

THE officers, executive committee and members of the Division of Geology and Geography of the National Research Council, for the year beginning July 1, are as follows: *Chairman,* Edson S. Bastin; *Vice-chairman,* Robert S. Platt; *Executive Committee,* Edson S. Bastin, Robert S. Platt, Donald C. Barton, Florence Bascom, F. H. Lahee and Frank E. Williams; *Representatives of Societies,* Donald C. Barton and A. F. Buddington, Geological Society of America; J. F. Schairer, Mineralogical Society of America; Charles Butts, Paleontological Society; Robert S. Platt and Frank E. Williams, Association of American Geographers; John K. Wright, American Geographical Society; Thomas B. Nolan, Society of Economic Geologists; F. H. Lahee, American Association of Petroleum Geologists; *Members at large,* Florence Bascom, Edson S. Bastin and L. F. Thomas.

DR. FREDERIC WILLIAM SIMONDS, professor of geology at the University of Texas, will retire from active full-time service at the end of the present school year. He will continue his work at the University of Texas on a part-time basis under the provisions of the retirement plan recently adopted by the Board of Regents. Dr. Simonds served on the faculties of Cornell University, the University of North Carolina and the University of Arkansas before going to the University of Texas in 1890. During his forty-six years of service in the department of geology at the University of Texas his chief interest has been the physiography of Texas and the Southwest.

DR. W. MCKIM MARRIOTT, dean of the Washington University School of Medicine since 1923 and professor of pediatrics, has been appointed dean of the Medical School of the University of California. He will also hold a newly established chair of research medicine. As dean he succeeds Dr. R. L. Porter, who is retiring. Temporarily the administration of the medical school of Washington University will be in the hands of a committee of which Dr. David P. Barr, professor of internal medicine, is chairman, and which includes Dr. Evarts A. Graham, head of the department of surgery, and Dr. Philip A. Shaffer, head of the department of biochemistry.

DR. JULIAN D. CORRINGTON, head of the educational service department of the Ward Natural Science Establishment, Rochester, formerly of the faculty of Drew University, has been appointed professor of biology at Washington College, Chestertown, Md.

DR. DAVID HARKER, of the California Institute of Technology, has been appointed instructor in charge of the first-year course in chemistry at the Johns Hopkins University.

DR. M. L. OLIPHANT, of the Cavendish Laboratory, the University of Cambridge, has been appointed to the Poynting chair of physics at the University of Birmingham, which will become vacant next September, owing to the retirement of Professor S. W. Johnson Smith.

Museum News states that Frederick Chapman, of the National Museum, Melbourne, has retired from the post of commonwealth paleontologist and has been succeeded in that office by Miss J. Crespin.

DAVID STURROCK, of Lanark, Scotland, formerly director of the Hershey Agricultural School, Cuba, has been appointed superintendent of the Atkins Institution of the Arnold Arboretum at Soledad, Cuba. He will succeed Robert M. Grey, who has resigned after thirty years of service to the institution, including ten years as superintendent.

DR. H. GARLAND HERSHEY, for five years a member of the Maryland Geological Survey, has been appointed assistant to the state geologist of Iowa.

DR. D. G. CATCHESIDE, lecturer in the department of botany at King's College, University of London, has been awarded a Rockefeller fellowship for research in cytogenetics. He will spend the year, beginning in September, working in Professor T. H. Morgan's Laboratory at the California Institute of Technology.

THE Committee on Scientific Research of the American Medical Association has renewed for one year a grant to Dr. J. R. Murlin for further study of the effects of male hormones on metabolism. A grant also has been made to Dr. Isaac Schour, of the University of Illinois College of Dentistry, to aid in his investigation on the rôle of the parathyroids in calcium metabolism.

PROFESSORS C. L. TURNER and Orlando Park, of the department of zoology of Northwestern University, are spending the summer at the Barro Colorado Station, Panama. Dr. W. R. Duryee has been spending the current year in European laboratories.

THE third Denver-Wyoming Expedition, directed by Dr. E. B. Renaud, of the University of Denver, left on June 15 to continue the archeological survey of the High Western Plains. Proceeding north and south, the expedition will explore the basin of the Green River, Black's Fork and tributaries. Dr. Renaud expects to make a collection of paleolithic implements.

Dr. T. H. PEAR, professor of psychology at the University of Manchester, has been appointed the Riddell Memorial lecturer at the University of Durham for the academic year 1936–37.

DR. HARLAN T. STETSON, of Harvard University, addressed a joint meeting of the American Institute of Radio Engineers and the Radio Club of America at the Museum of Natural History in New York on June 3. The subject was "Cosmic Cycles and Radio Transmission."

DR. RAYMOND PEARL, professor of biology at the Johns Hopkins University, addressed the Medical Section of the American Life Convention at its annual meeting in White Sulphur Springs, W. Va., on June 11 on "Constitutional Factors in Diseases of the Cardio-vascular-renal System."

THE eleventh International Congress of Psychology, which was to have met in Madrid in September, has been postponed for a year.

THE seventh International Congress of Genetics will be held during the second half of August, 1937, in Moscow. Members of the organization committee are as follows: *President,* A. I. Muralov, president of the Lenin Academy of Sciences; *Vice-presidents,* N. I. Vavilov, vice-president of the Lenin Academy of Sciences, and V. L. Komarov, vice-president of the Academy of Sciences; *General Secretary,* S. G. Levit; *Other members,* N. P. Gorbunov, G. D. Karpachenko, B. A. Keller, N. K. Koltzoff, T. D. Lysenko, G. K. Meister, H. J. Muller, M. S. Navashin and A. S. Serebrovsky. All those wishing to receive announcements in regard to the congress should send their names to the Organization Committee of the Seventh International Congress of Genetics, Institute of Genetics, Academy of Sciences, Bolshaya Kaluzhskaya 75, Moscow, USSR.

THE first International Conference on Fever Therapy, originally scheduled for the end of September, has been postponed because of numerous requests, to permit more time for the preparation of material. The new dates set for this conference are from March 30 to April 2, 1937. The sessions will be held at the College of Physicians and Surgeons, Columbia University, New York City. Invitations on behalf of the conference will be issued by the state department to ministries of public health of other countries. The medical departments of the Army, the Navy and the Public Health Service will be represented, as will also the New York City Departments of Health and of Hospitals. A tour has been arranged to take place immediately following the conference, to enable physicians to observe the techniques employed in fever therapy in some of the hospitals in the eastern section of the United States. Further information may be obtained from the general secretary, Dr. William Bierman, 471 Park Avenue, New York City, U. S. A.

THE scientific meetings of the second session of the eleventh annual meeting of the Hawaiian Academy of Science were held at the University of Hawaii on May 14 and 15. Fourteen papers were presented, including an invitation paper entitled "Stock-taking in Ethnology," by Dr. Peter H. Buck, recently appointed director of the Bernice P. Bishop Museum. The annual banquet was held at the Pacific Club on the evening of May 16. This was followed by the annual business meeting. The address by the retiring president, Dr. Chester K. Wentworth, was entitled "Modern Bench-forming Processes on Oahu Shores." The following officers were elected for 1936–37: *President,* Dr. Harold A. Wadsworth (soil physics), University of Hawaii; *Vice-president,* Dr. Walter Carter (entomology), Experiment Station, Pineapple Producers' Cooperative Association; *Secretary-Treasurer,* Miss Mabel Slattery, Queen's Hospital; *Councilor for two years,* Dr. Oscar C. Magistad (chemistry), Hawaii Agricultural Experiment Station; *Councilor for one year* (hold-over), Edward Caum (botany), Experi-

ment Station, Hawaiian Sugar Planters' Association, and *Councilor-ex-officio,* Dr. Chester K. Wentworth (geology), Board of Water Supply.

A CANCER INSTITUTE will be held at the Medical School of the University of Wisconsin, under the auspices of the Alumni Research Foundation, from September 7 to 9, inclusive. The general outline of the program, which will be available upon inquiry after July 1, follows: I. *Etiology of Cancer.* (A). Intrinsic Factors: Drs. Kreyberg, Oslo; Little, Bar Harbor, Me., and Macklin, London, Ont. (B) Extrinsic Factors: Drs. Allen, Columbia, Mo.; Andervont, Boston, and Murphy, New York City. II. *Cytology.* Drs. Ewing, New York City; Lewis, Baltimore, and Reimann, Philadelphia. III. *Irradiation.* Drs. Coutard, Paris, and Failla, New York City. IV. *Surgery.* Dr. Novak, Baltimore.

THIRTY exceptional students, selected from thirteen Canadian universities, have been awarded postgraduate scholarships for the year 1936–37 by the National Research Council at Ottawa. The policy of assisting exceptional students to pursue postgraduate work in Canadian universities has been followed since the inception of the council, the object being to build up in Canada a supply of well-trained scientific men capable of undertaking and carrying through any research investigations required in the promotion and development of industrial processes looking to the better or more profitable utilization of Canadian raw materials and the expansion of markets for Canadian products. Awards are of three classes: bursaries, $500; studentships, $600; fellowships, $700. The council has announced that the grants this year include two fellowships, eleven studentships and seventeen bursaries.

DISCUSSION

SUBMERGED VALLEYS ON CONTINENTAL SLOPES AND CHANGES OF SEA LEVEL

IN an article with the above title Hess and MacClintock proposed a new explanation for submarine canyons.[1] They suggested that there was a sudden change in the shape of the hydrosphere which depressed sea level in low latitudes and raised it in high latitudes and that this was followed by a reshaping of the lithosphere which brought the sea level back to normal. As a cause for such shifts they suggested, somewhat hesitantly, that there might have been a sudden change in the rate of rotation of the earth.

Probably astronomers will agree with Professor Russell (as quoted by Hess and MacClintock) that a sudden change in the rate of rotation is almost out of the question, but it is worth considering what would happen if some unknown force did suddenly decrease the rate of rotation. The hydrosphere would, of course, react first and send the water to the polar regions and away from the equator. There would be neutral lines in between, along which there would be no change in level. These would appear at about 35° north and south latitude.[2] The canyons would be cut at depths increasing from zero at the neutral lines to a maximum at the equator. Hess and MacClintock state that the facts available are compatible with the hypothesis, but they state also that canyons are found off Newfoundland, Vancouver Island and Ireland, all in latitudes well north of this neutral line.

While these authors have (as just shown) disproved their own contention there are some aspects of their arguments which need further consideration. The statement that canyons grow shallower going away from the equator is certainly a surprise to one who is familiar with the soundings of the canyons in various parts of the world. It is quite true that soundings have not revealed canyons off the Arctic coasts as yet, but this might be explained by the scarcity of soundings in those areas and might also be due to the presence of ice caps in the Arctic during the canyon-cutting episode. Canyons are found, however, at 55° latitude in Bering Sea and perhaps farther north. The deepest thoroughly authentic canyons are located around 34 to 40 degrees of latitude, including the deep canyons off California, Japan and Portugal. Hess and MacClintock based their statement of the tracing of a canyon to 14,000 feet below sea level on a survey which would not be considered adequate to any one familiar with the hydrographic work.[3] From older, more reliable soundings it seems not unlikely that the deep depressions of the Bahamas are fault troughs.

Hess and MacClintock make another statement which requires discussion. They refer to my tentative suggestion that the canyons were the result of locking of sea water in glaciers formed in polar regions, stating that the idea is impossible, since the ice would have to reach a thickness of 50,000 feet. This statement shows unfamiliarity with the idea so summarily dismissed. I have never claimed that the canyons owed their greatest depths to glacial lowering of sea level, but I have suggested that lowering of several thousand feet could have been produced by polar ice caps. For a

[1] SCIENCE, April 3, 1936, p. 332.

[2] This figure was supplied by Dr. H. R. Brahna and its correctness is affirmed by Dr. H. N. Russell.

[3] In 1932 the U. S. Navy kindly loaned the use of a submarine and tender for gravity work in the West Indies. Unfortunately the only vessels available were not equipped with adequate echo-sounding machines. As a result, while the gravity work constituted a notable contribution, the soundings were clearly unreliable.