

This competition was designed to stimulate a healthful rivalry in the undergraduate work of mathematics departments in colleges and universities in the United States and Canada and is open only to undergraduates. The examination questions were taken from the fields of calculus, higher algebra, differential equations and geometry.

The competition is made possible by the trustees of the William Lowell Putnam Intercollegiate Memorial Fund, left by Mrs. Putnam in memory of her husband, a member of the Harvard class of 1882. It is sponsored by the Mathematical Association of America and is held annually.

W. D. CAIRNS,
Secretary-Treasurer

DEGREES CONFERRED BY THE UNIVERSITY OF PENNSYLVANIA ON THE OCCASION OF THE DEDICATION OF THE FRANKLIN INSTITUTE

As part of the ceremonies of the dedication of the Franklin Institute of Philadelphia, degrees were conferred on May 20 by the University of Pennsylvania on five scientific men who gave lectures. In conferring these degrees Dr. Thomas S. Gates, president of the university, made the following citations:

GEORGE DAVID BIRKHOFF: For many years mathematicians have recognized you as a leader; your work and inspiration have guided the path of many to high places in American research. Your great genius has opened new fields in differential equations and dynamics. With your powerful methods in these fields, you have shed new light on the problem of three bodies, on the calculus of variations and on topology.

ARTHUR LOUIS DAY: Under your expert and generous direction the Geophysical Laboratory of the Carnegie Institution has more than fulfilled the purpose of its founder to encourage discovery and the application of knowledges

to the improvement of mankind. With skilful new techniques you and your staff have plotted the equilibria of rock formations at atmospheric pressures, have synthetically reproduced the laboratory of nature far below the earth's crust, and have revealed the history of oceans by exploring the strata of their deepest beds.

GILBERT NEWTON LEWIS: An intuitive yet logical investigator, you have with brilliant results brought your own dynamic energy and insight to bear upon the phenomena of forces determining molecular structures. In the School of Chemistry of the University of California you have organized a center of teaching and research which has influenced the work of physical chemists everywhere. It is through minds such as yours that the world comes increasingly to "the knowledge of causes and secret motions of things, and the enlarging of the bounds of human empire, to the effecting of all things possible."

THOMAS HUNT MORGAN: The great figures in science have ever been more than recorders of newly discovered fact. The true pathfinders have been those who, like you, idealize their task and bring to it the fervor of imagination and faith. Preserving always that most difficult balance between old and new you have opened new vistas in the structure of germ cells and the mechanism of heredity which have won a Nobel Prize and acknowledged leadership. Your boldly constructive mind and your enthusiasm have inspired a notable group of co-workers who will carry to dark places the torch you have lighted.

LOUIS MARTIN: As Marie Curie has written, in science we must be interested in things, not in persons. Yet it is with peculiar pleasure that the Franklin Institute and the University of Pennsylvania welcome you to-day as the worthy inheritor of a great tradition. In your studies of the toxins of diphtheria and tetanus, your work on the hospitalization of contagious diseases, and the treatment of sleeping sickness and meningitis you have successfully applied methods learned from your distinguished predecessor. As hospital director and Director of the Pasteur Institute you have brought a new brilliance to the medical science of your country.

SCIENTIFIC NOTES AND NEWS

DR. JOHN J. ABEL, who retired with the title emeritus in 1932 from the professorship of pharmacology at the Johns Hopkins University, now director of the Laboratory of Endocrine Research, has been elected a foreign member of the Royal Society, London. Dr. Abel celebrated his eighty-first birthday on May 19.

DR. ROSS G. HARRISON, Sterling professor of biology at Yale University, has been elected a foreign member of the Royal Swedish Academy of Science, Stockholm.

DR. HARVEY CUSHING, professor of neurology emeritus in the School of Medicine of Yale University and professor of surgery emeritus of Harvard University, has been elected an honorary member of the Biological Society of Vienna.

DR. RICHARD GOLDSCHMIDT, professor of zoology, University of California, has been elected a foreign member of the Royal Society of Copenhagen.

At the eighty-fifth commencement exercises of the University of Maine the doctorate of science will be conferred on Dr. Harry Steenbock, professor of agricultural chemistry at the University of Wisconsin.

FORMAL presentation of the Mendel Medal of Villanova College to Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, was made at a dinner given in his honor on May 18.

DR. O. A. JOHANSEN, head of the department of entomology at Cornell University, was given a testimonial dinner on the evening of April 30 by his col-

leagues, former students and graduate students in the department. Nearly two hundred were present at the dinner. Dr. Cornelius Betten acted as master of ceremonies. Brief addresses were made by: Dr. Hugh Glasgow, of the State Experiment Station at Geneva, N. Y.; by Dr. C. E. Ladd, dean of the College of Agriculture; Dr. Arthur Gibson, chief Dominion entomologist of Canada, and by Dr. James G. Needham, of Cornell. Dr. Johannsen, who retires from active teaching at the end of this academic year, responded. He and Mrs. Johannsen are sailing for Europe in June. They expect to be abroad during the coming year. Dr. Johannsen will attend the seventh International Congress of Entomology at Berlin from August 15 to 20.

DR. WILLIAM M. MANN, director of the National Zoological Park, and Mrs. Mann have been awarded the Franklin L. Burr Prize of \$1,000 in recognition of the success of their biological expedition to the Netherlands Indies last year. The Burr award originated with the late Mary C. Burr, of Hartford, Conn., who bequeathed in memory of her father a fund to the National Geographic Society, the income to be used in awarding prizes to those members of the society's expeditions considered by the Board of Trustees to have done "especially meritorious work in the field of geographic science."

THE Institute of Medicine of Chicago announces that the Joseph A. Capps Prize of \$500 for medical research, founded by the late Dr. Edwin R. LeCount, has been awarded for 1937 to Dr. Ronald R. Greene for his work on "The Experimental Production of Intersexuality in the Female Rat." The award is made annually for the most meritorious investigation in medicine by a graduate of a recognized medical school in Chicago within two years after the completion of an internship or of one year in laboratory work.

CLAY MYERS GREER, research associate in pharmacology at Vanderbilt University School of Medicine, has been awarded the prize given by the Committee on International Congresses of the Federation of American Societies for Experimental Biology for the best piece of work presented by any one in pharmacology with a rank below that of associate professor. This prize consists of a trip to Zurich to the Physiological Congress, which will meet in August. The prize was given to Mr. Greer for his work on "[β -(3, 4-Dihydroxyphenyl), - β -Hydroxyethylamine] as a Possible Mediator in the Sympathetic Division of the Autonomic Nervous System."

DR. CLARK WISSLER, curator of ethnology at the American Museum of Natural History and professor of anthropology in the Institute of Human Relations

at Yale University, was elected president of the American Association of Museums on May 18 at the annual meeting held in Philadelphia.

THE American Association of Pathologists and Bacteriologists at the recent meeting held at Atlantic City elected the following officers for the ensuing year: *President*, Dr. Earl B. McKinley, Washington, D. C.; *Vice-president*, Dr. Carl V. Weller, Ann Arbor, Mich.; *Treasurer*, Dr. F. B. Mallory, Boston, Mass.; *Secretary*, Dr. Howard T. Karsner, Cleveland; *Incoming Member of the Council*, Dr. Paul R. Cannon, Chicago; *Assistant Treasurer*, Dr. Frederic Parker, Jr., Boston; *Assistant Secretary*, Dr. Harold M. Dixon, Cleveland. It was voted to meet next year on April 6 and 7 at the Medical College of Virginia, Richmond.

AMONG members of the faculty of Cornell University who will retire at the end of the year are: Dr. Madison Bentley, psychology; Drs. George W. Cavanaugh and Emile M. Chamot, chemistry, and Dr. Virgil Snyder, mathematics. Among those appointed to professorships are: Dr. Arthur B. Burrell, plant pathology; Dr. Guy F. MacLeod, economic entomology; Dr. Lowell F. Randolph and Frederick Z. Hartzell, chief in research at the Geneva Experiment Station, botany, and Dr. Ralph P. Agnew and Dr. Jacob R. Collins, physics.

At Yale University Dr. Howard W. Haggard, associate professor of applied physiology, has been promoted to a professorship and has been appointed director of the laboratory of applied physiology to succeed Professor Yandell Henderson, who retires from the directorship at the close of the academic year. Dr. Albert E. Parr, associate professor of zoology, director of the Peabody Museum of Natural History and curator of the Bingham Oceanographic Collection, has also been promoted to a professorship.

DR. KURT GOLDSTEIN, head of the Neuro-physiological Laboratories at the Montefiore Hospital and clinical professor of neurology at Columbia University, has been appointed William James lecturer in philosophy and psychology at Harvard University for the first semester of the academic year 1938-39; Dr. Kurt Lewin, professor of child psychology at the University of Iowa, has been appointed lecturer on dynamic psychology at the Harvard Psychological Clinic for the second semester. Dr. S. Smith Stevens has been promoted to be assistant professor of psychology in the Harvard Psychological Laboratory.

DR. GEORGE KREEZER, research associate in the department of research of the Training School at Vineland, N. J., has been appointed assistant professor of psychology at Cornell University.

PROFESSOR J. NELSON SPAETH, of the Cornell University Agricultural Experiment Station, has been appointed professor and head of the department of forestry to be established at the University of Illinois. He will also serve as chief of forestry in the Agricultural Experiment Station.

DR. W. F. K. WYNNE-JONES, of the University of Reading, England, has been appointed to the chair of chemistry in University College, Dundee, which will become vacant in September by the retirement of Professor Alexander McKenzie.

DR. S. S. GOLDWATER, since 1934 commissioner of the department of hospitals, New York City, has announced his decision to retire from the service of the city. The resignation will become effective as soon as his successor is appointed.

DR. HUGH GLASGOW, chief in research in entomology at the State Experiment Station, Geneva, N. Y., has been appointed chief of the Division of Entomology, effective on July 1. The appointment fills the vacancy occasioned by the promotion last January of Professor P. J. Parrott to the position of director.

DR. JUSTIN ANDREWS, associate professor of protozoology at the School of Hygiene and Public Health of the Johns Hopkins University, has resigned to become director of the Division of Malaria Investigation of the Georgia State Department of Public Health at Atlanta.

DR. WALLACE M. YATER, professor and head of the department of medicine of Georgetown University School of Medicine, is the recipient of a grant from the American Medical Association to aid in the continuation of his studies of the pathogenesis of bundle-branch block. The first report of this study will appear in monograph form in the *Archives of Internal Medicine* within the next few months.

THE Commonwealth Fund has made a three-year grant to Western Reserve University for the study of the mechanism of heart failure, to be expended through Dr. Joseph T. Wearn, professor of medicine.

THE National Advisory Cancer Council has approved the application of Duke University, on behalf of Dr. J. W. Beard, for studies on the properties of virus protein and related material in the amount of \$2,625, with the understanding that the National Cancer Institute will consider favorably the appointment and assignment of a research fellow to work under the direction of Dr. Beard.

DR. WALTER B. CANNON, George Higginson professor of physiology, Harvard University Medical School, delivered the William H. Welch lectures at Mount Sinai Hospital, New York City, on May 18,

19 and 30, on "Some New Aspects of Homeostasis" and "The Aging of Homeostatic Mechanisms."

DR. G. H. WHIPPLE, dean of the School of Medicine and Dentistry of Rochester University, spoke on April 19 at the meeting of the Duke Chapter of Sigma Pi, his subject being, "Hemoglobin, Plasma Protein and Tissue Proteins—their Production and Interrelation in the Body."

DR. GEORGE ELWOOD NICHOLS, professor of botany at Yale University and director of the Yale Botanical Gardens, addressed the University of Cincinnati Chapter of Sigma Xi at its annual initiation meeting on May 14 on "Arctic-Alpine Vegetation of North America."

DR. HOMER C. THOMPSON, head of the department of vegetable crops at Cornell University, delivered the Sigma Xi initiation lecture before the Pennsylvania State College Chapter on May 6, on "Temperature Relations of Flowering in Certain Plants."

DR. ERNEST CARROLL FAUST, professor of parasitology and chief of the laboratory of the department of tropical medicine at Tulane University, gave the annual guest lecture of the Mobile Academy of Science on May 4. His subject was "Malaria, with Special Reference to its Epidemiology, Geographical Distribution and Prevalence in the Southern United States."

THE Botanical Society of America and the American Society of Plant Taxonomists have arranged two joint summer meetings for 1938. The first of these meetings will be held at Ottawa, from June 27 to July 1 in connection with the summer meeting of the American Association for the Advancement of Science. The tentative program includes field trips to the peat bog at Mer Bleue, to King's Mountain and adjacent woods and to the sandy district at Constance Bay. A garden party will be held at the Dominion Experimental Farms on the afternoon of June 28. Local arrangements are in charge of a committee of which J. Adams, Acting Dominion Botanist of the Division of Botany of the Dominion Experimental Farms, is chairman. Those members of the two societies who plan to attend the Ottawa meeting should address Mr. Adams and advise him whether they expect to join in the field trips and whether they will bring their own cars. The second summer meeting will be held at the University of Iowa Field Station at Lake Okoboji, Iowa, August 23 to 26. Requests regarding accommodations should be addressed to Dr. W. A. Anderson, Department of Botany, University of Iowa.

THE department of physics of the University of Chicago and the Yerkes Observatory is organizing a symposium on "Recent Progress in the Interpretation of Molecular Spectra and in the Study of

Molecular Spectra in Celestial Objects." It will open on Wednesday, June 22, and is expected to last for four days. The following speakers have tentatively agreed to participate in the program: Professor Gerhard Herzberg, University of Saskatchewan; Professor Davis M. Dennison, University of Michigan; Dr. Hans G. Beutler, University of Chicago; Professor John T. Tate, University of Minnesota; Professor Robert S. Mulliken, University of Chicago; Dr. Rupert Wildt, Princeton University Observatory; Dr. Arthur Adel, Lowell Observatory; Professor N. T. Bobrovnikoff, Perkins Observatory, Delaware, Ohio; Dr. G. H. Shortley, the Ohio State University; Dr. Karl Wurm, Yerkes Observatory, University of Chicago, formerly of the Astrophysical Observatory, Potsdam; Dr. W. W. Morgan, Yerkes Observatory. Astronomers and physicists are invited to attend the symposium and to participate in the scientific discussions. Graduate students attending the summer school of the University of Chicago in the department of physics or the Yerkes Observatory are also invited.

THE New England Geographical Conference held its 1938 meeting in the Institute of Geographical Exploration at Harvard University on May 6 and 7, under the presidency of Robert M. Brown, of the Rhode Island College of Education. Those in attendance were guests of Dr. A. Hamilton Rice, director of the institute, at tea, and afterwards inspected an exhibit of maps prepared by Dr. Erwin Raisz. Harold S. Kemp, of the department of geography at Harvard University, gave the principal address on "The Spanish War; Is Geography Involved?" Papers dealing with scientific geography were as follows: L. O. Packard, "Recreation as a Topic in Economic Geography"; William T. Miller, "New Frontiers in New England"; Earl B. Shaw, "Geographic Influences on Aland's Windjammers"; Louise G. Ramsdell, "Old

Highways of Europe and Their Importance"; Edward A. Ackerman, "The Balkan Switzerland." Other papers treated aspects of the teaching of geography.

AMHERST COLLEGE will receive \$207,327 by the will of Dr. Ellwood R. Kirby, who died in December, 1935.

As residuary legatee of the late Charles Felix Burke, of New York City, Denison University at Granville, Ohio, receives the sum of \$133,834.

THE London *Times* reports that G. Seligman is heading a party of scientific men to the Jungfrauoch Research Institute in Switzerland to undertake scientific research work on glaciers. This will be the first British expedition to spend its whole time in studying glaciological problems, and it will form a continuation of Mr. Seligman's previous researches on the nature of snow. The party will spend five months at the institute, at a height of over 11,000 feet, and it will consist of T. P. Hughes, of the Physical-Chemical Laboratory; M. F. Perutz, of the Crystallographic Laboratory; A. E. Benfield, of the department of geodesy and geophysics, and E. A. Ferguson, of the department of geography, all of the University of Cambridge. They will investigate the transition of firm (or partly consolidated snow) into glacier ice; the movement of glaciers; the formation of ice-bands, and the connection, if any, between those in the *névé* regions and those near the snout of the glacier. In addition, Mr. Hughes will carry out certain experiments on the friction of solid bodies on ice, in connection with his work at the Physical-Chemical Laboratory. Mr. Seligman has been granted a Leverhulme Research Fellowship for the purpose of this research, and the expedition is also supported by the Royal Geographical Society, the Ski Club of Great Britain and the Alpine Ski Club.

DISCUSSION

THE LOWER SONORAN IN SOUTH-WESTERN UTAH

READERS of the interesting articles of W. P. Cottam¹ and F. R. Fosberg² may be interested in additional information concerning the effect of the prolonged subzero weather reported by Cottam on plants of the Lower Sonoran zone in southwestern Utah.

The writer visited the Long Valley region on the upper Virgin River (altitude 6,000 feet) on May 7 and 8, 1937, and noted as a common occurrence dead brown twig tips from one to six inches in length on

many but not a majority of the junipers, *Juniperus utahensis*, in the region east of Zion Canyon in the Upper Sonoran zone. On repeated visits to the Long Valley region in early August, late August, mid-September and late November, the dead twig tips were less and less conspicuous until by fall they were scarcely noticeable.

On a visit to the Virgin River lower down (3,000 feet) between St. George and Hurricane on August 23 and 24, 1937, and again on September 12, it was noted that in that vicinity practically all the plants of both the creosote bush and mesquite showed frost injury, ranging from dead twig tips through dead limbs to dead trunks, but in no cases observed were any

¹ W. P. Cottam, *SCIENCE*, 86: 563-564, June 11, 1937.

² F. R. Fosberg, *SCIENCE*, 87: 39-40, Jan. 14, 1938.