tion for Archeology, Andover, Mass., toward the cost of publication of the data from collaborative studies upon the Boylston Street Fishwier [the remainder of the cost having been secured elsewhere], $300.

Philip M. Morse and Julius A. Stratton, professor and associate professor of physics, respectively, the Massachusetts Institute of Technology, for assistance in completing the calculation of tables of functions involved in the theory of wave radiation and scattering, $450.

Leigh Hoadley, professor of zoology, Harvard University, for assistance in the study of nerve processes arising from isolated portions of the embryonic brain, and the differentiated tissues into which the processes lead, $150.

ALUMNI LECTURES AT THE UNIVERSITY OF CINCINNATI

DR. A. J. CARLSON, of the University of Chicago, in his excellent address "Science *versus* Life," the nineteenth annual Sigma Xi lecture in Philadelphia on December 30 last,[1] mentions that the universities are quite generally lax in arranging for advanced science lectures to be offered to their graduates in "Alumni Go Back to College" courses. The department of chemical engineering of the University of Cincinnati is at least one faculty which has arranged for a series of free talks, "Recent Trends in Chemical Engineering," to be given at monthly intervals, only to their alumni. Half the evenings are devoted to lectures by the faculty, the others by their own alumni who have become distinguished in some field of chemical engineering.

"Industrial Bacteriology," October 16, Dr. H. S. Greene, associate professor of chemical engineering, University of Cincinnati.

"Food Technology," November 14: (a) "Evolution of the Modern Bake Oven," Michael J. Colacurcio, assistant superintendent, Strietman Biscuit Co., Cincinnati. (b) "Some Phases," George Garnatz, chief of staff, Kroger Food Foundation, Cincinnati.

"Physical Chemistry," December 9, Dr. E. F. Farnau, professor of physical chemistry, University of Cincinnati.

"Industrial Colloids," January 16: (a) "Synthetic Sudsing, Detergent and Wetting Agents," W. F. Schanzle, Procter and Gamble, Cincinnati. (b) "Glues," Clark B. Rose, plant engineer and director of research, Chemical Products Corporation, Cincinnati. (c) "Rubber Technology," Joseph Rochoff, head of laboratories, Dayton Rubber Manufacturing Company, Dayton.

"Metallurgy," February 26, Dr. R. O. McDuffie, associate professor of metallurgy, University of Cincinnati.

"Paper Technology," March 18: (a) "Technical Development of Coated Paper," Alex J. Wildman, research engineer, Champion Paper and Fibre Company, Hamilton, Ohio. (b) "Twenty Years of Progress in the Technology of Uncoated Paper," Daniel Fuentes, control chemist, Champion Paper and Fibre Company.

An inexpensive dinner get-together precedes each talk. This year, the first in which the plan was adopted, practically 30 per cent. of the alumni within twenty-five miles of Cincinnati attended the talks which have been given so far. So much enthusiasm has been aroused that a similar series of lectures is already planned for next year. The advantages to both the alumni and faculty are so obvious that they need not be stated.

S. B. ARENSON

AWARDS IN THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

PROFESSOR W. D. CAIRNS, secretary-treasurer of the Mathematical Association of America, has announced that the department of mathematics of Brooklyn College has won the first prize of $500 in the fourth annual William Lowell Putnam Mathematical Competition. The members of the winning team were Richard Bellman, Peter Chiarulli, Hyman Zimmerberg. The second prize of $300 is awarded to the department of mathematics of the University of Pennsylvania, the members of whose team were S. I. Askovitz, Hyman Kamel, P. C. Rosenbloom. The third prize of $200 is awarded to the department of mathematics of the Massachusetts Institute of Technology, the members of the team being J. R. R. Baumberger, Eugene Calabi, W. S. Loud.

In addition to these prizes to the departments of mathematics with winning teams, a prize of $50 each is awarded to the following five persons whose scores ranked highest in the six-hour examination (the names are arranged in alphabetical order): R. F. Arens, University of California at Los Angeles; S. I. Askovitz, University of Pennsylvania; A. M. Gleason, Yale University; E. L. Kaplan, Carnegie Institute of Technology; P. C. Rosenbloom, University of Pennsylvania. Of these five, one will later be chosen to receive a $1,000 graduate scholarship for one year at Harvard University. This award will be announced later. The members of the three winning teams will receive individual cash prizes according to the ranks of their teams, and all individuals receiving prizes will also receive medals.

Honorable mention has been awarded this year to three teams and to six individuals. The teams are from the Department of Mathematics, Carnegie Institute of Technology, Pittsburgh, members being R. E. Beatty, E. L. Kaplan, N. H. Painter; the Department of Mathematics, Cooper Union Institute of Technology, New York, members being Murray Klamkin, Benjamin Lax, Samuel Manson; and the Department of Mathematics, Yale University, New Haven, mem-

[1] Printed in winter, 1940, issue of the Sigma Xi quarterly.

bers of the team being A. M. Gleason, G. R. MacLane, D. M. Merrill. The six individuals receiving honorable mention are: Richard Bellman, Brooklyn College; Harvey Cohn, College of the City of New York; W. S. Loud, Massachusetts Institute of Technology; G. R. MacLane, Yale University; Samuel Manson, Cooper Union Institute of Technology; Hyman Zimmerberg, Brooklyn College.

The fourth annual William Lowell Putnam Mathematical Competition was held on March 1. One hundred and forty-six undergraduate mathematics students from 44 colleges and universities in the United States and Canada took part. Qualified readers graded the examination books, complete anonymity being maintained throughout by the use of numbers instead of names for identification.

The first competition was held in April, 1938, the second in March, 1939, the third in March, 1940. This competition was designed to stimulate a healthy rivalry in the undergraduate work of departments of mathematics in colleges and universities in the United States and Canada, and is open only to undergraduates. The examination questions are taken from the fields of calculus, higher algebra, differential equations and geometry.

The Putnam 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, and is sponsored by the Mathematical Association of America.

ADMISSIONS TO THE FELLOWSHIP OF THE ROYAL SOCIETY

THE following were elected on March 20 fellows of the Royal Society, London:

W. N. BENSON, professor of geology, University of Otago, Dunedin, New Zealand; distinguished for his contributions to the geology, petrology and physiography of Australia and New Zealand and in particular for his studies on the ultra-basic igneous rocks.

H. J. BHABHA, reader in theoretical physics, Indian Institute of Science, Bangalore; distinguished for his contributions to the understanding of cosmic ray phenomena and to the fundamental theory of the elementary atomic particles.

E. C. BULLARD, Smithson research fellow of the Royal Society; distinguished for his work in geophysics and for the light which his work has thrown on the structure of the Great Rift Valley and on the rock floor deep under the surface in England and the surrounding seas.

C. D. DARLINGTON, director of the John Innes Horticultural Institution; distinguished for his researches in cytology and cytogenetics.

P. I. DEE, university lecturer in physics, Cambridge; distinguished for his experimental work in nuclear physics, in particular on atomic nuclear transformations produced artificially under bombardment by high speed protons or deuterons.

S. F. DUDLEY, Surgeon Rear-Admiral, medical director-general of the Navy (designated); medical officer in charge R.N. Hospital, Chatham; formerly deputy medical director-general R.N.; distinguished for his work in epidemiology and bacteriology, especially in relation to the spread of diphtheria, influenza and meningitis.

J. C. ECCLES, director of the Kanematsu Memorial Institute for Pathology in Sydney, formerly Rhodes Scholar (Australia) and fellow of Magdalen College, Oxford; distinguished for his physiological researches which have dealt principally with excitation and transmission in the neuromuscular system.

H. W. FLOREY, professor of pathology in the University of Oxford, formerly Rhodes Scholar (Australia), fellow of Gonville and Caius College, Cambridge, and professor of pathology, Sheffield; distinguished for his work in general pathology, in particular on lacteals and lymphatics and on Brunner's glands. His work on "lysozyme" has led to its isolation in a pure form.

A. A. GRIFFITH, research engineer, Rolls Royce, Ltd., formerly Royal Aircraft Establishment, Farnborough; distinguished for researches, ranging from pure physics to applied engineering, which have made notable contributions to the knowledge of strength of materials and to the science and development of aircraft and aero-engines.

H. W. MELVILLE, professor of chemistry in the University of Aberdeen, formerly fellow of Trinity College, Cambridge; distinguished for his outstanding contributions in the study of gaseous reactions and of the mechanism of polymerisation.

J. NEEDHAM, reader in biochemistry in the University of Cambridge, and fellow of Gonville and Caius College; distinguished for his application of biochemical methods to embryology, particularly in relation to the conditions determining embryonic and adult metabolism, and vertebrate development.

SIR DAVID RIVETT, deputy chairman and chief executive officer of the Australian Council for Scientific and Industrial Research, formerly Rhodes Scholar (Australia) and professor of chemistry in the University of Melbourne. His scientific knowledge and leadership have been of great value to the Australian Commonwealth and the Empire.

ALEXANDER ROBERTSON, professor of organic chemistry in the University of Liverpool; distinguished for his researches on the constitution of plant products, and particularly on the important insecticide rotenone.

T. G. ROOM, professor of mathematics in the University of Sydney; distinguished for his work in geometry.

A. J. ROWLEDGE, mechanical engineer, chief designer, Rolls Royce, Ltd., formerly chief designer, D. Napier and Sons, Ltd.; distinguished for innovations in the design and development of internal combustion engines for motor vehicles and aircraft.

H. SCOTT, assistant keeper of entomology in the British Museum (Natural History); distinguished as a field naturalist and systematist. By prolonged visits to the Seychelles, Abyssinia and South Arabia he has greatly advanced our knowledge of the little known and fast disappearing or changing fauna of these areas.