

Chairmen of the sessions include Ira N. Gabrielson, director, U. S. Fish and Wildlife Service; Walter H. Chute, director, John G. Shedd Aquarium, Chicago; Warren W. Chase, regional director, U. S. Soil Conservation Service; Arthur D. Hasler, department of zoology, University of Wisconsin, and Miles D. Pirnie, director, Kellogg Bird Sanctuary, Battle Creek, Michigan. H. H. Bennett, director of the U. S. Soil Conservation Service, will address the conference at the annual banquet on November 14.

As already reported in *SCIENCE* the Natural Resources Building, the new home of the Illinois Natural History Survey and the Geological Survey, on the south campus of the university, will be dedicated on November 15. The Geological Survey is sponsoring a conference on coal, oil, gas and industrial minerals, and will join the Natural History Survey in the dedication ceremonies. Participating will be representatives of the Federal and State Governments, through which construction funds were provided, and of cooperating universities, research institutions and industrial organizations. The dedication address of Dr. Isaiah Bowman, president of the Johns Hopkins University, will be followed by a reception in the new building and by a banquet in the evening.

Originating at Urbana in 1935, the Midwest Wildlife Conference has annually since that time assumed increased importance among wildlife technicians of the central part of the country. States usually represented, in addition to Illinois, are Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio and Wisconsin. This year, Kansas and Oklahoma will send wildlife technicians to take part in the special clinic on prairie chickens planned for November 14.

AWARD OF THE WILLIAM H. NICHOLS MEDAL OF THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY

DR. LINUS PAULING, head of the division of chemistry and chemical engineering of the California Institute of Technology, has been awarded the William H. Nichols Medal for 1941 of the New York Section of the American Chemical Society, according to an announcement made by Professor Arthur W. Hixson, of Columbia University, chairman of the medal jury.

Dr. Pauling is cited "for his distinguished and

pioneer work on the application of quantum mechanics to chemistry and on the size and shape of chemical molecules." The presentation will be made at a dinner of the section on March 7, at which time he will deliver the annual address of the Nichols medallist. The official statement by the jury giving the grounds for which the award was made reads:

Dr. Pauling has profoundly influenced the whole of chemical thought. His study of "The Nature of the Chemical Bond," appearing last year, was acclaimed by critics as the most valuable work on molecular structures in relation to chemistry published for a number of years. It excited more interest and enthusiasm than any treatise on a specialized topic in chemistry since Gilbert N. Lewis and Merle Randall, of the University of California, published their "Thermodynamics" in 1923.

Dr. Pauling has pioneered in applying quantum mechanics to chemistry. He has done much to explain the manner in which atoms are linked together to form molecules and why certain atoms react and combine differently under different circumstances. His contributions have been technical as well as theoretical. He has developed methods of testing conclusions drawn from theoretical study, and means of measuring the size and shape of molecules.

Because of the chemical rules which have been formulated by Dr. Pauling, chemists are able to predict the reaction of certain molecules under various conditions. His work applies equally to organic, biological and inorganic chemistry. He has shed light on the shape and activity of the protein molecule. By using actual experimentation to check his theoretical explanations of the manner in which atoms in the protein molecule must combine, Dr. Pauling has eliminated a number of hypotheses concerning the shape of the molecule.

It was Dr. Pauling who discovered that a radius of activity could be assigned to each atom; that is, there is a definite amount of space "filled" by each atom with its force. Adjacent carbon and oxygen atoms are therefore usually at a set, determinable distance apart. When this distance varies it is an indication of some force exerting influence. Dr. Pauling has originated methods of accounting for such forces and consequently of explaining in part some of the erratic properties of atoms.

Dr. Pauling has been responsible for the application of the resonance phenomenon to chemistry. This phenomenon accounts for the attraction and repulsion that atoms have for one another, and also in part for the manner in which atoms bind together to form molecules. It aids in explaining valence bonds, the links between atoms.

SCIENTIFIC NOTES AND NEWS

DR. JAMES EWING, emeritus professor of pathology at the Cornell University Medical School and formerly director of Memorial Hospital for the treatment of cancer and allied diseases, was presented with the fourth Clement Cleveland Medal of the New York

City Cancer Committee at a dinner given on October 30 in the National Arts Club. The medal was awarded for "outstanding work during the year in the campaign to control cancer."

For his article entitled "The Surface of the Nearest

Star," printed in the *Journal* of the Society of Motion Picture Engineers, Dr. Robert R. McMath, director of the McMath-Hulbert Observatory of the University of Michigan, was presented with the Journal Award of the society at the banquet held at the recent annual meeting at Hollywood, California.

MEDALS for distinguished service to China were presented on October 25 on behalf of the Chinese Government by Dr. F. C. Yen, formerly Chinese National Health Administrator, to eleven directors of the American Bureau for Medical Aid to China. Among those who received medals are Dr. James B. Murphy, member of the Rockefeller Institute for Medical Research in charge of cancer research; Dr. George Morris Piersol, professor of medicine in the Graduate School of Medicine of the University of Pennsylvania and medical director of the Bell Telephone Company of Pennsylvania; Dr. Homer W. Smith, professor of physiology, and Dr. George B. Wallace, professor of pharmacology, both of the New York University College of Medicine.

DR. T. HARPER GOODSPEED, director of the botanical gardens of the University of California, has been elected to honorary membership in the Santa Barbara Botanic Garden.

A MEDAL has been established by the Royal Astronomical Society of Canada to be awarded annually for work by amateur astronomers. It will be known as the Chant Medal, in honor of Dr. C. A. Chant, director emeritus of the Dunlap Observatory of the University of Toronto and a past president of the society. It is hoped to make the first award next January. The medal will be of silver and will be three inches in diameter.

Nature states that the following are serving as officers of the Society of Chemical Industry for 1940-41: *President*, Professor J. C. Philip; *Honorary Treasurer*, Dr. L. H. Lampitt; *Honorary Foreign (or Overseas) Secretary*, Dr. Wm. Cullen; *Chairman, Bureau of Chemical Abstracts*, Dr. L. H. Lampitt; *General Secretary*, H. J. Pooley, Clifton House, Euston Road, London, N.W.1.

DR. L. C. KNIGHT, professor of mathematics at the College of Wooster, has retired after thirty-two years of service.

DR. JOHN EVERETT GORDON, professor of preventive medicine and epidemiology at the Harvard Medical School and director of the new Harvard public health unit and the Harvard-Red Cross Hospital in England, has been appointed to succeed the late Dr. Hans Zinsser as Charles Wilder professor of medicine and epidemiology.

DR. HERBERT A. YOUNG, assistant professor of chemistry at the College of Agriculture at Davis of

the University of California, has been appointed acting chairman of the department of chemistry to fill the vacancy left by the death of Professor C. S. Bisson.

LEONARD W. MAYO, chairman of the Westchester, N. Y., County Council of Social Agencies and president of the Child Welfare League of America, has been appointed dean of the School of Applied Social Sciences of Western Reserve University. Mr. Mayo will take up the work of associate dean and professor of social administration in January and will succeed Dr. J. Elbert Cutler as dean in June.

PROMOTIONS in the School of Medicine of Western Reserve University include Dr. Claude S. Beck, who has been made professor of neurosurgery, and Dr. John A. Toomey, who has been appointed professor of clinical pediatrics and contagious diseases.

DR. L. DAVID HINER, of the department of pharmacy of the South Dakota State College, has been appointed professor of pharmacy at the Ohio State University.

DR. LAURENCE H. SNYDER, of the Ohio State University, will be visiting professor of medical genetics at the Medical School of Duke University during the winter quarter of 1941. While there he will also lecture on medical genetics at the University of North Carolina and at Wake Forest College.

PROFESSOR GEORGE POLYA, who has been at the Technische Hochschule in Zurich for two years, has joined the staff of the department of mathematics at Brown University.

DR. JAMES R. SCOTT, professor of health education at the University of New Mexico, has been appointed state director of public health of New Mexico. He succeeds Dr. Edwin B. Godfrey, of Santa Fe, who resigned several months ago.

ACCORDING to the *Journal* of the American Medical Association, Dr. James F. Worley, senior surgeon, U. S. Public Health Service, medical director of the Alaska division of the Indian Medical Service, Juneau, has been transferred to Minneapolis as medical director of district Number 1, comprising the states of Michigan, Wisconsin, Minnesota, Iowa, Nebraska and North and South Dakota.

DR. WILLIAM C. MEYER, professor of astronomy at the University of California at Berkeley, has been appointed associate director of relations with schools for the university. Dr. Hiram W. Edwards, who is director, will continue to work at Los Angeles, and Dr. Meyer will supervise activities in the northern part of the state.

DR. C. I. BLISS, of Sandusky, Ohio, has been ap-

pointed biometrician in the Agricultural Experiment Stations at New Haven and at Storrs, Conn. For the present he will work on a half-time basis. During the remainder of the year he plans to continue his work as consulting biometrician at various institutions.

SINCE July 1, 1939, the Rockefeller Foundation has supported a research program on molecular spectra at the University of Chicago under the direction of Professor Robert S. Mulliken, with the cooperation of Dr. Hans G. Beutler. Dr. Lyle W. Phillips, research assistant the first year, has accepted a position as instructor in physics at the University of Illinois. Dr. Anthony Turkevich is now research assistant. Dr. Carol A. Rieke has continued as research assistant in charge of computation. Dr. Stanislaus Mrozowski, formerly docent in physics at the University of Warsaw, has recently become a research fellow.

PROFESSOR FRANK H. SMITH, of the department of engineering of the University of Michigan, has leave of absence for a year to serve with the ordnance department of the U. S. Army.

It is stated in the *Journal* of the American Medical Association that a medical subcommittee of the Committee to Defend America by Aiding the Allies, of which William Allen White, editor of the *Emporia, Kansas, Gazette*, is chairman, has been formed. The subcommittee urges physicians to enroll in local branches of the main committee, to send letters and telegrams to congressmen and presidential candidates stressing the need for all possible aid to Britain and to send contributions to the national committee. Members of the subcommittee are Drs. Emile Holman, Eugene S. Kilgore and Ray Lyman Wilbur, San Francisco; Roger I. Lee, Boston; Warfield T. Longcope, Baltimore; John H. Musser, New Orleans, and Dallas B. Phemister, Chicago.

DR. CARL D. LARUE, of the department of botany, has leave of absence for the first semester from the University of Michigan to study rubber cultivation in Bolivia.

DR. HERMANN J. MULLER has accepted the invitation of Amherst College to work in the department of biology as guest investigator during the academic year 1940-41. Dr. Muller has been a member of the staff at the Institute of Animal Genetics at Edinburgh for the past two years. He recently returned to the United States, as work in genetics has been discontinued in Scotland because of the war. Dr. Muller will continue his work on gene mutation and chromosome breakage in *Drosophila* at Amherst.

DR. B. GOTTLIEB, formerly director of the histologic laboratory of the Dental School of the University of Vienna, is now on his way to the United States. He

will be associated with the Dental School of the University of Michigan.

The New York Herald Tribune's tenth annual Forum on Current Problems, organized under the general subject, "America's Second Fight for Freedom, 1776-1940," was held on October 22 at the Waldorf-Astoria Hotel. Among the speakers in the second session, entitled "Science and Industry Mobilize," were Professor Harlow Shapley, director of the Harvard Observatory; Dr. W. F. G. Swann, director of the Bartol Research Foundation of the Franklin Institute, and Dr. Harold C. Urey, of Columbia University.

DR. CHARLES ARMSTRONG, senior surgeon of the U. S. Public Health Service, National Institute of Health, Washington, D. C., delivered the first Harvey Society Lecture of the current series at the New York Academy of Medicine on October 31. He spoke on "Studies on Lymphocytic Choriomeningitis and Poliomyelitis."

THE Western Society of Naturalists will meet at the University of California at Los Angeles on December 18, 19 and 20. Two symposia have been arranged; one on "Training for Research and Instruction in the Biological Sciences," and the other on "Perspective in Marine Biology." In addition a number of scientific papers will be presented. Professor Wesley R. Coe, of Yale University, will make an address at an evening smoker on December 18.

JAMES STOKLEY, of Science Service, gave on October 22 the first Francis Bergen Memorial Lecture of the 1940-41 season at Yale University. His subject was "Astronomical Adventures."

DR. ARNOLD L. GESELL, professor of child hygiene at Yale University, will give an address entitled "The First Five Years of Life" at the annual meeting of the Massachusetts Society for Mental Hygiene, which will be held at the Twentieth Century Club, Boston, on November 21.

THE fifty-sixth annual autumn meeting of the Indiana Academy of Science will be held from November 14 to 16 at Muncie, with the Ball State Teachers College as the host institution. Frank N. Wallace, state entomologist, will preside. An attendance of about five hundred is expected.

THE registered attendance at the sixty-ninth annual meeting of the American Public Health Association and meetings of related organizations held in Detroit during the week of October 7 was 3,187. Delegates came from every state in the Union, the District of Columbia, Alaska, Hawaii, Puerto Rico, Canada, Cuba, Mexico, Denmark, China and New Zealand. The officers elected for the year 1940-41 are as follows: *President*: W. S. Leathers, Nashville; *President-*

elect: John L. Rice, New York; *Vice-president*: Robert D. Defries, Toronto; *Vice-president*: Charles Edward Finlay, Havana; *Vice-president*: Selskar Gunn, New York; *Treasurer*: Louis I. Dublin, New York; *Chairman of the Executive Board*: Abel Wolman, Baltimore; *Executive Secretary*: Reginald M. Atwater, New York. A Committee on Public Health in the National Defense was appointed with the following personnel: W. S. Leathers, chairman, Stanley H. Osborn, Huntington Williams and Abel Wolman. Among the resolutions passed was one emphasizing the necessity for maintaining civilian health as essential to national defense and pledging the united support of members to national defense and to the maintenance of health in a free people. The seventieth annual meeting will be held in Atlantic City, N. J., in October, 1941.

THE School of Mathematics of the Institute for Advanced Study each year allocates a small number of stipends to gifted young mathematicians and mathematical physicists to enable them to study and to do research work at Princeton. Candidates must have given evidence of ability in research comparable at least with that expected for the degree of doctor of philosophy. Blanks for application may be obtained from the School of Mathematics of the Institute, Fuld

Hall, Princeton, N. J., and are returnable by February 1, 1941.

ANNOUNCEMENT has been made by the Finney-Howell Research Foundation, Inc., that applications for fellowships for next year must be filed in the office of the foundation, 1211 Cathedral Street, Baltimore, Md., by January 1. This foundation was provided for in the will of the late Dr. George Walker, of Baltimore, for the support of "research work into the cause or causes and the treatment of cancer." The will directed that the surplus income from the assets of the foundation together with the principal sum should be expended within a period of ten years to support a number of fellowships in cancer research, each with an annual stipend of two thousand dollars, "in such universities, laboratories and other institutions, wherever situated, as may be approved by the board of directors." Fellowships are awarded for the period of one year, with the possibility of renewal up to three years; when deemed wise by the board of directors, special grants of limited sums may be made to support the work carried on under a fellowship.

THE new session of the faculty of medical science of King's College, London, located until lately at Glasgow, opened at the medical school of the University of Birmingham on October 9.

DISCUSSION

MULTISENSUAL MATHEMATICAL TERMS

MATHEMATICS belongs to the many smaller, but now very active, scientific laboratories of the lexicographers. In a paper by H. Poincaré (1854–1912) read at the Fourth International Congress of Mathematicians, held at Rome, Italy, in 1908, it is asserted that mathematics is the art of giving the same name to different things. Hence the use of multisensual terms in mathematics is not exceptional even if it requires that the reader select meanings when he may not be in position to decide wisely. In very early times mathematics developed in part a special language, as may be seen in the ancient Babylonian algebraic writings which have only recently been deciphered by O. Neugebauer and others. In one of the most influential medieval mathematical books called "Summa" (1494) its author, L. Pacioli, seriously asked the question whether it is not a contradiction to say that when we multiply by a number which is less than unity the product is less than the multiplicand, since the Bible uses the term "multiply" to mean increase.

In more recent times the mathematicians have greatly extended the use of the term "multiply" by not only multiplying by negative and complex numbers but also by multiplying where no numbers at all are involved, as in the case of group operations

where the term is used simply to denote the combination of elements and is sometimes used interchangeably with adding. In the ancient mathematical literature the omission of a symbol of operation between two elements commonly implied addition, but since medieval times it more commonly implies multiplication. While multiplication at first implied only a special kind of addition, *viz.*, the case when the addends are equal to each other, it has assumed during the ages meanings which have little in common with this original meaning and the lexicographers would probably find it impossible to furnish a satisfactory explanation of these elementary extensions of meanings.

Among the many instances of mathematical terms which have become multisensual much more recently than the term multiplication we may mention the term group, which is one of the many simple English words whose mathematical meaning has become difficult and is now often misunderstood even by writers on mathematical subjects. As a technical term it was introduced by a young Frenchman, E. Galois (1811–1832), who was practically unknown at the time of his early death, but whose reputation has grown since then and is now one of the greatest among the comparatively small galaxy who became known solely on