

mathematics and astronomy at Nebraska Wesleyan University, died on September 30 at the age of seventy-six years.

THE death is announced on October 20 of Frederick Arthur Halsey, formerly editor of *The American Machinist*, at the age of seventy-nine years. Mr. Halsey received the gold medal of the American Society of Mechanical Engineers in 1923 for the "Halsey Premium System."

THOMAS A. BUCKLAND, formerly New York City chemist, past president of the St. Louis College of Pharmacy, died suddenly on October 13 at the age of seventy-two years.

LEWIS A. WELLS, who was chief observer of the Blue Hill Observatory of Harvard University with

which he had been connected for forty years, died on October 11 at the age of fifty-eight years.

IN memory of the late Dr. Frederick N. G. Starr, for many years professor of clinical surgery at the University of Toronto Faculty of Medicine, according to the *Journal* of the American Medical Association, Mrs. Starr has arranged for a gold medal to be awarded by the Canadian Medical Association to any member of the association who adds distinction to the profession by his attainment in science, art or literature. It will be awarded annually or when in the judgment of a committee the occasion arises for the distinction. Dr. Starr was for several years general secretary of the association and president in 1927. He died in April, 1934.

SCIENTIFIC NOTES AND NEWS

THE Chemical Industry Medal of the Society of Chemical Industry will be presented to Dr. Edward R. Weidlein, head of the Mellon Institute of Industrial Research in Pittsburgh, on November 8, at a meeting of the society held jointly with the American Chemical Society, in recognition of the valuable applications of chemical research to industry that have been carried out under his direction. Dr. Weidlein will present a paper entitled "Various Results of Being Researchful," and Dr. L. V. Redman will speak on the subject of the medalist himself. Dr. D. D. Jackson, of Columbia University, will make the presentation. The meeting will be held at 7:45 P. M. at The Chemists' Club, New York City. A dinner in honor of Dr. Weidlein will be held immediately preceding the meeting.

DR. OAKES AMES, who recently resigned as Arnold professor of botany, supervisor of the Arnold Arboretum and director of the Botanical Garden of Harvard University, has been awarded the George Robert White Medal of Honor of the Massachusetts Horticultural Society for his service to horticulture over a long period of years.

THE Architectural League has awarded the Michael Friedsam Medal for 1935 to Professor Charles Russell Richards, executive vice-president of the New York Museum of Science and Industry. This medal goes to the individual who has contributed in the greatest degree toward the development of art in industry. It was presented to Professor Richards with the following citation: "To Charles Russell Richards, distinguished educator in the fields of science and art, and notable for his constructive contributions to each; quick in his understanding of the importance of the alliance of art and industry, and foremost in the giv-

ing of practical, effective help through the spoken and written word. To the accomplishment of this end the Michael Friedsam Medal is given in worthy recognition of his service, a part of the history of the arts of decoration in this country."

A COMMITTEE of nine trustees and members of the faculty of Cornell University has been appointed "to search out available candidates for appointment as president of Cornell University and inquire into and report upon their qualifications." Last year President Farrand, who was formerly professor of anthropology at Columbia University, brought before the board the question of his retirement, and it was announced in January that he had acceded to the board's request that he continue to serve until June, 1937, when he will have reached the age of seventy years. The committee appointed by Judge Hiscock, chairman of the board of trustees, comprises five trustees and four members of the faculty, he himself having been appointed by the trustees a member *ex-officio*. The other trustee members are J. Du Pratt White, '90, chairman; Robert H. Treman, '78; Baneroft Gherardi, '93, and Jervis Langdon, '97; from the faculty, Professors Julian P. Bretz, American history; Herman Diederichs, '97, director of mechanical engineering; Carl E. Ladd, '12, dean of agriculture and home economics, and Floyd K. Richtmyer, '04, dean of the Graduate School.

THE German Röntgen Society has recently elected as honorary members Dr. Antoine Bécélère of Paris; Professor Rudolf Jaksch-Wartenhorst, of Prague; Charles Thurstan Holland, of Liverpool; Professor J. M. Woodburn Morison, of London, and Dr. George E. Pfahler, of Philadelphia.

DURING the course of the Melbourne meeting of the British Medical Association, the following members received honorary degrees from the University of Melbourne: Lord Horder, Sir Henry Gauvain, Dr. J. S. Fairbairn, Sir William Willecox, Dr. Edwin Bramwell, Dr. E. Kaye Le Fleming, Sir Ewen Maclean, Dr. Robert Hutchison, Sir Lindo Ferguson and Dr. E. Wilfred Fish. The Royal Australian College of Surgery conferred honorary fellowships on H. S. Souttar and Professor Hey Groves. The Australasian federal government has announced that as the first step towards a permanent memorial of the meeting, there is to be established immediately a Federal Medical Research Council with the cooperation of the states.

DR. P. E. BROWN, head of the department of agronomy at the Iowa State College, was tendered a special dinner by the members of the department on the occasion of his fiftieth birthday on October 9, and also in recognition of the completion of twenty-five years of service in the department. Dr. W. H. Stevenson, formerly head of the department, paid tribute to Dr. Brown and to the service he has rendered to Iowa State College and to soil science.

RALPH E. FLANDERS, president of the Jones and Lamson Machine Company at Springfield, Vt., and president of the American Society of Mechanical Engineers, was the honor guest at a dinner of the Colorado section of the society on October 11. Mr. Flanders spoke on "The Engineer and Social Progress."

THE convocation of the Victoria University of Manchester gave a dinner on October 18 in honor of the new vice-chancellor, Professor J. S. B. Stopford, professor of anatomy and lately dean of the Medical School.

DR. ALFRED BIELSCHOWSKY, the German ophthalmologist who visited Dartmouth College for six months earlier in the year, has joined the faculty with the title of visiting lecturer in ophthalmology.

HAROLD S. NEWINS, associate professor of forestry at the Michigan State College, has been appointed by the Florida State Board of Control professor of forestry, to establish a department of forestry at the University of Florida.

PROFESSOR FRANKLIN FEARING, of the department of psychology of Northwestern University, has leave of absence this semester to teach at the University of California at Los Angeles; Professor J. P. Guilford, chairman of the department of psychology at the University of Nebraska, has taken his place at Northwestern University.

THE following additions have been made to the staff

of the department of physiology at the Ohio State University: Assistant professors: Dr. Hans O. Haterius, of Washington Square College of New York University, and Dr. George W. Thorn, of the Massachusetts General Hospital; instructors: Dr. A. J. Derbyshire, Harvard Medical School; Dr. A. H. Hegnauer, Washington University Medical School; Dr. E. J. Robinson, Washington Square College, and Dr. S. R. Tipton, University of Rochester Medical School.

AT Temple University, Professor A. A. Schaeffer is chairman of the department of biology, not of the department of bacteriology, as was erroneously stated in a recent issue of *SCIENCE*.

AT the Rockefeller Institute for Medical Research, Dr. Ernest L. Spencer has been promoted from the rank of fellow to that of assistant in the division of plant pathology and Dr. Hubert S. Loring and Dr. George L. McNew have been made fellows in the division of plant pathology.

DR. EDWIN ALLEN LOCKE, clinical professor of medicine at the Harvard Medical School, has been appointed supervisor of health, physical education and the athletic program at Williams College.

CLAUD L. HORN, formerly associate horticulturist of the Virgin Islands Experiment Station, has been appointed associate horticulturist of the Puerto Rico Experiment Station of the U. S. Department of Agriculture. Mr. Horn will have charge of economic plant introductions. Dr. A. N. Watson, formerly assistant to the director of personnel and associate agricultural economist of the Bureau of Census, has been appointed biometrician and plant physiologist at the Puerto Rico Experiment Station.

HAROLD L. BABCOCK, curator of reptiles and amphibians in the Boston Society of Natural History, has been elected a member of the corporation of the Bermuda Biological Station.

LEAVE of absence for the first semester of the university year 1935-1936 has been granted to Professor Walter L. Badger, of the department of chemical engineering at the University of Michigan, so that he may complete certain investigations which he has under way at the present time.

DR. OSCAR RIDDLE, investigator at the Carnegie Station for Experimental Evolution, Cold Spring Harbor, Long Island, has returned from an extended tour of European laboratories after attending the International Physiological Congress in Leningrad as delegate of the Carnegie Institution of Washington.

DR. ROLLINS A. EMERSON, professor of plant breeding and formerly dean of the Graduate School at Cornell University, has completed, with his associate,

J. H. Kempton, of the U. S. Department of Agriculture, a preliminary survey of the system of maize culture practised by the Maya Indians of the northern part of the Yucatan Peninsula.

DR. ROSS A. GORTNER, professor of agricultural biochemistry and chief of the division of biochemistry at the University of Minnesota, George Fisher Baker non-resident lecturer in chemistry at Cornell University for the first term this year, gave a public lecture on October 16 on "Scientific Genealogy."

DR. THOMAS M. RIVERS, of the Rockefeller Institute for Medical Research, New York, will deliver the annual Lilly Heard Anderson lecture in pediatrics at the Academy of Medicine in Atlanta on November 14. His subject will be "Virus Diseases of the Central Nervous System."

DR. WILDER D. BANCROFT, professor of physical chemistry at Cornell University, whose grandfather, George Bancroft, founded the United States Naval Academy as Secretary of the Navy under President Polk, was a principal speaker at exercises in Annapolis, Md., commemorating on October 10 the ninetyeth anniversary of the academy. Later, at Washington, D. C., Dr. Bancroft helped to dedicate a tablet to his grandfather, placed on the house where the former secretary lived.

DR. FRED CONRAD KOCH, professor of physiological chemistry and chairman of the department of physiological chemistry and pharmacology at the University of Chicago, delivered the seventh annual William T. Belfield Lecture before the Chicago Urological Society on October 24. The subject of the lecture was "The Biochemistry and Physiological Significance of the Male Sex Hormones."

DR. EDWARD KASNER, professor of mathematics at Columbia University, addressed on October 5 the Galois Institute of Mathematics on "Transformations and Groups in Geometry."

THE North Central Branch of the Society of American Bacteriologists held its second semi-annual meeting at the University of Wisconsin on October 11. Contributed papers on various phases of bacteriology were presented at the forenoon and afternoon programs. At the evening dinner meeting at which there were ninety in attendance, Dr. Paul F. Clark, of the University of Wisconsin, spoke on the "Sources and Modes of Infection in Poliomyelitis." Officers for the present year were elected as follows: Dr. R. E. Buchanan, Iowa State College, *president*; Dr. A. T. Henrici, University of Minnesota, *vice-president*; Dr. R. H. Walker, Iowa State College, *secretary-treasurer*, and Dr. E. B. Fred, University of Wisconsin, representative on the council of the national society.

DR. HOWARD W. HAGGARD, associate professor of applied physiology at Yale University, will give the second public lecture in the new series sponsored by the New York Academy of Medicine on November 14, on "Medicine in the Days of the Great Monarch." Other lectures will be given by Dr. Alexis Carrel, of the Rockefeller Institute for Medical Research, on "The Mystery of Death," December 12; Dr. Harlow Brooks, "Medicine of the American Indian," January 9; Dr. Benjamin P. Watson, "How We Learned About the Human Body," February 13; Dr. Foster Kennedy, "The Organic Background of Mind," March 12; Dr. Elmer V. McCollum, the Johns Hopkins University, "The Story of Vitamins," April 9; Dr. George Draper, "Man—The Common Denominator of Disease," May 14. The first lecture in this series was given by Dr. Walter B. Cannon, on October 3, on "The Wisdom of the Body."

THE Pennsylvania Conference of College Physics Teachers was held on October 11 and 12 at State College, Pennsylvania. The principal speaker was Dr. Paul D. Foote, executive vice-president of the Gulf Research and Development Corporation, Pittsburgh, whose topic was "Research in the Petroleum Industry." There were sessions for both students and teachers. Dr. Wheeler P. Davey, of State College, chairman of the conference, presided. The spring meeting of the conference will be held at Wilson College, Chambersburg, Pa.

THE two hundred and first regular meeting of the American Physical Society will be held in Baltimore, Maryland, on Friday and Saturday, November 29 and 30, at the Johns Hopkins University. Other meetings for the current season are as follows: 202. Berkeley, California. December 20-21, 1935; 203. Annual meeting. St. Louis, Missouri. December 31, 1935-January 2, 1936.

THE twenty-fourth annual meeting of the American Association of Variable Star Observers was held at the Harvard College Observatory on October 18. Charles W. Elmer, of New York, vice-president of the association, and Professor Harlow Shapley, Leon Campbell and Dr. Annie Jump Cannon, of the Harvard Observatory, were among the speakers.

AN Intersectional Meeting of the American Chemical Society will be held in Schenectady and Troy on October 25 and 26. The activities will begin with registration at Rice Hall, General Electric Company, at Schenectady at 9:30 A. M., Friday, followed by inspection trips of various parts of the General Electric Works and a series of short talks and demonstrations by members of the research staff of the General Electric Company. Following a greeting by Dr. Edward

Ellery, professor of chemistry and chairman of the faculty of Union College at the chemical laboratory, papers will be presented. The visitors will then go to Troy and will inspect the new aeronautical, chemical and metallurgical engineering laboratory of Rensselaer Polytechnic Institute. An informal dinner will be held at 7:00 P. M. at which the president of the institute, Dr. William O. Hotchkiss, will greet the visitors. At 8:30 P. M. Dr. C. E. K. Mees, of the research department of the Eastman Kodak Company, will give an illustrated lecture on "Color Photography and the Kodachrome Process." Saturday morning will be given over to the presentation of papers at the Walker Chemical Laboratory.

IN order to have as its guest and principal speaker Dr. Robert A. Millikan, of the California Institute of Technology, the annual meeting of the U. S. Institute

for Textile Research will be postponed from November 7 to November 14, but will be held as originally planned at the Waldorf-Astoria, New York, N. Y. To celebrate the end of its fifth year, and to honor Dr. Millikan, the institute will give a dinner that evening at which President Francis P. Garvan, who is also president of the Chemical Foundation, will act as toastmaster. Another feature of the dinner will be reports of several applications of scientific textile research in the mills by technicians responsible for them. Dr. J. R. Katz, director of the institute's warp sizing research, now in progress at the Massachusetts Institute of Technology, will also speak. The regular annual meeting and meeting of the board of directors will be held in the morning. In the afternoon the Research Council will hold an open conference on the subject of creping of regenerated rayon and acetate fabrics, to which all who are interested are invited.

DISCUSSION

THE SOLUTE AS LIQUID

ONE of van't Hoff's great achievements was the proof that in dilute solutions a dissolved substance behaves in some respects like an ideal gas. A corollary, not drawn by van't Hoff, was to consider the solute as in all respects like a gas. Nernst¹ stated that a third substance, added in small amounts, has no more effect on the solubility than a gas will have on the partial pressure of a solid. This is not true experimentally, because any addition of alcohol to a saturated solution of sugar or sodium chloride will cause a decrease in solubility.² There is no need of speaking of a change in thermodynamic environment.

If we start with ether and methyl alcohol, the alcohol is called a gas and the ether a liquid at all concentrations if one has a rubber diaphragm, while the ether will be called a gas and the alcohol a liquid at all concentrations if one uses an animal bladder membrane. On the other hand, one of the criteria of two ideal liquids, benzene and toluene at 35°, is that the two shall mix without volume expansion or contraction. So far as volume relations are concerned, neither liquid behaves as a gas at any concentration.

This has been recognized by Lumsden,³ who stated that a binary, non-aqueous solution is a mixture of two liquids. He excluded aqueous solutions because of difficulties in connection with ionization, hydration, etc. While these present problems experimentally, they do not affect the general principles. Putting Lumsden's concept in a broader form, all liquid solu-

tions are mixtures of liquids, regardless whether any or all of the pure components are solids, liquids, vapors or gases at the temperature of the experiment. As such, all the components will show some of the properties of liquids.

If either component of a binary solution may act in some respects as a liquid and in other respects as a gas, we must clear up the apparent discrepancy. That is merely a question of wording. Instead of saying that at low concentrations the solute behaves more or less like an ideal gas so far as osmotic pressure relations are concerned, we say that at low concentrations a solute (present as liquid) or a suspended particle (present as solid, liquid or gas) behaves more or less like an ideal gas so far as osmotic pressure is concerned. This includes both the van't Hoff generalization and also the Einstein⁴ generalization that suspended particles behave like an ideal gas when the sol is dilute.

Perrin⁵ speaks of gamboge granules large enough to be visible in sunlight under a strong lens as behaving like an ideal gas with a molecular weight of two hundred thousand tons. Nobody supposes that these gamboge particles are gases or that the crystals of gold in a red gold sol are not solid. When we call a solute a gas, it is a purely metaphysical gas.

Some interesting consequences follow. A fused salt is a liquid. If the fused salt is considered to be completely dissociated, the ions must be liquids at the temperature in question. If the fused salt is not completely dissociated, the ions must either be liquids or

¹ Nernst, "Theoretische Chemie," 386, 1893; Nernst-Codd, "Theoretical Chemistry," 564, 1923.

² Lash Miller, *Jour. Phys. Chem.*, 1: 633, 1897.

³ Lumsden, *Jour. Chem. Soc.*, 91: 24, 1907.

⁴ Einstein, *Ann. Physik*, (4) 17: 549, 1905; 19: 280, 371, 1906.

⁵ Perrin, "Brownian Movement and Molecular Reality," 46, 1910.