

of the meeting, one will be by Professor Linus Pauling, president of the Pacific Division, on "The Relation of Molecular Structure to Biology and Medicine," and the second by Professor Agnes Fay Morgan, of the University of California, who will speak on the subject of "Nutrition in Wartime." Arrangements for the third address are incomplete.

The morning of Tuesday, June 15, will be devoted to a general symposium on the subject "A Century of Science in the Pacific Northwest," in which three papers will be contributed in the fields of agriculture, forestry and engineering.

A session devoted to reviews of current research will constitute the program of Tuesday afternoon. Four speakers will outline recent advances in the fields of genetics, botany, zoology and mathematics.

The following affiliated organizations have indicated their intention to participate in the meeting:

<i>Organization</i>	<i>Secretary or Program Chairman</i>
American Association of Economic Entomologists, Pacific Coast Branch	Roy E. Campbell, Alhambra, California
American Association of Physics Teachers	C. J. Overbeck, Northwestern University
American Association of Physics Teachers, Oregon Section	E. H. Collins, University of Oregon
American Chemical Society, Pacific Intersectional Division	E. C. Gilbert, Dept. of Chemistry, Oregon State College, Corvallis
American Geophysical Union Section on Hydrology	J. C. Stevens, Spalding Building, Portland, Oregon
American Mathematical Society	A. D. Michal, California Institute of Technology, Pasadena
American Phytopathological Society, Pacific Division	C. E. Yarwood, Division of Plant Pathology, University of California at Berkeley
American Society of Plant Physiologists, Western Section	D. I. Arnon, University of California at Berkeley

Association of Pacific Coast Geographers

Botanical Society of America, Pacific Section

California Academy of Sciences, Committee on Natural Illumination

Ecological Society of America, Western Section

Oceanographic Society of the Pacific

Oregon Psychological Association

Pacific Northwest Bird and Mammal Society

Society of American Foresters, Northern California Section

Society for Experimental Biology and Medicine, Pacific Coast Branch

Western Interstate Snow Survey Conference, Pacific Division

Western Psychological Association

Western Society of Soil Science

J. W. Hoover, 1224 S. McAllister Avenue, Tempe, Arizona

Bassett Maguire, Utah State Agricultural College, Logan

O. P. Jenkins, Division of Mines, State of California, San Francisco

H. de Forest, University of Southern California, Los Angeles

C. L. Utterback, University of Washington, Seattle

Allen East, University of Oregon Medical School, Portland

Earl J. Larrison, University of Washington, Seattle

Roy G. Wagner, 930 Phelan Building, San Francisco, California

Dr. Rosalind Wulzen, Department of Zoology, Oregon State College

R. A. Work, P.O. Box 1149, Medford, Oregon

Othniel R. Chambers, Oregon State College

W. P. Martin, University of Arizona

The program for the Corvallis meeting will be prepared during the month of May. Copies will be available at registration headquarters and will be mailed on request to members of participating societies. Each person planning to present a paper before one of the societies should communicate the title to the secretary or program chairman not later than April 15. In case the author is a member of a society which will not be participating in the Corvallis meeting, the title may be sent to the secretary of a closely related participating organization. Titles should be accompanied by abstracts of not over 200 words.

SCIENTIFIC NOTES AND NEWS

At the graduation ceremonies of the University of Buffalo, the chancellor's medal, awarded annually by the university council for outstanding achievement, was presented to Dr. George W. Thorn, Hersey professor of the theory and practice of physics in the Harvard Medical School and physician in chief of Peter Bent Brigham Hospital, Boston.

DR. ARTHUR W. BINGHAM, chairman of the committee on maternal welfare of the Medical Society of New Jersey, has been presented by the Academy of Medicine of Northern New Jersey with the fourth Dr. Edward J. Ill award—a bronze plaque given to a North Jersey physician by the academy "at such

time as it deems it wise, who merits it for extraordinary service as a physician and a citizen."

THE American Association of Economic Entomologists has designated as an outstanding accomplishment of 1942 researches on the chemical properties and the insecticidal value of so-called summer-type oil sprays when used against the eggs of the codling moth, the Oriental fruit moth and bud moth conducted by Dr. P. J. Chapman, entomologist, and G. W. Pearce and Dr. A. W. Avens, chemists of the New York State Agricultural Experiment Station at Geneva. The work is part of a comprehensive research program.

THE 1943 award in the annual nation-wide com-

petition sponsored by the Chicago Dental Society, for original research related to dental problems, was presented to Dr. Harry H. Shapiro and Dr. Raymond C. Truex, both assistant professors of anatomy at the College of Physicians and Surgeons, Columbia University. The prize-winning essay, entitled "The Temporomandibular Joint and Auditory Function," was read on February 22 at the annual meeting of the society in Chicago.

Nature reports that the medal of the British Institute of Metals has been awarded to Dr. Harold Moore for "outstanding services to non-ferrous metallurgy." Dr. Moore has been director of the British Non-Ferrous Metals Research Association since 1932. The medal, which is offered to the council of the institute by the Mond Nickel Company, Ltd., for award annually, is of platinum. Previous recipients have been Sir William Bragg, Sir Harold Carpenter, Dr. Paul Merica, Dr. C. H. Desch and Sir W. Murray Morrison. It was presented to Dr. Moore at the annual general meeting held in London on March 3.

At the one hundred and twenty-first annual commencement of the Philadelphia College of Pharmacy and Science on February 24 the degree of doctor of science was conferred on Dr. William A. Feirer, director of the medical research laboratories of Sharp and Dohme, Inc., and on Dr. Harriet L. Hartley, of the Department of Public Health of the City of Philadelphia.

THE doctorate of science of Rollins College was conferred at the Founders' Day convocation exercises on George Howard Opdyke, of Hartford, Conn., mining engineer and petroleum geologist.

DR. H. JUSTIN RODDY, since 1926 professor of geology and executive curator of the Museum of Franklin and Marshall College, has been appointed professor and curator emeritus.

ACCORDING to *Nature*, the Committee of the Athenaeum, London, has elected the following, under the provisions of Rule II of the club, which empowers the annual election by the committee of a certain number of persons of distinguished eminence in science, literature or the arts, or for their public services: Professor Emile Cammaerts, professor of Belgian studies and institutions in the University of London; Admiral Sir Andrew Cunningham and Professor W. N. Haworth, professor of chemistry in the University of Birmingham.

DR. EUGENE MARKLEY LANDIS, professor of internal medicine at the University of Virginia, Charlottesville, has been appointed, effective on July 1, George Higginson professor of physiology at the Harvard Medi-

cal School, Boston, to succeed Dr. Walter B. Cannon, who recently retired.

DR. THOMAS BIGELOW CRUMPLER has been appointed head of the department of chemistry in the College of Arts and Sciences of Tulane University. He has been on the teaching staff at Tulane since 1937. Dr. Worden Waring has been appointed to an assistant professorship and Dr. Walter James Horton, Dr. Kurt Kraus and Dr. Billie Shive have been appointed instructors.

DR. ERNEST GARDNER, instructor in anatomy at Stanford University, has been appointed assistant professor of anatomy at the School of Medicine of the University of Southern California. Dr. Arnold Lazarow, formerly of the department of anatomy of the University of Chicago, is now research assistant in the department of anatomy of the University of Southern California.

DR. JOHN ALFRED RYLE, regius professor of physics at the University of Cambridge and physician extraordinary to the King of England, has been elected professor of social medicine at the University of Oxford.

DR. KENNETH A. BARTLETT, acting director of the Puerto Rico Federal Experiment Station since November, 1941, has been appointed director.

R. E. ZIMMERMAN, vice-president of the U. S. Steel Corporation, has been elected a member of the Board of Trustees of Franklin and Marshall College.

DR. LEWIS HILL WEED, director of the School of Medicine of the Johns Hopkins University, has been made chairman of the Medical and Health Advisory Committee of the American Red Cross. Dr. Weed has been chairman of the Division of Medical Sciences of the National Research Council since 1939.

DR. A. C. DAHLBERG, head of the dairy division of the New York State Experiment Station at Geneva, has been granted leave of absence by Cornell University in order to carry out a special mission in Central America and the northern part of South America for the U. S. Department of Agriculture and the Office of the Counsellor on Inter-American Affairs of the State Department. He will make available to Latin America the knowledge and experience available in this country on milk processing and dairy manufactures. His work will consist of surveys of the dairy industries of the countries he visits and of counsel with government and educational officials, farmers and dairy plant operators as an aid to stimulating milk production, increasing dairy manufactures and improving dairy practices. Dr. R. E. Hodgson, formerly of the Washington State College and now with

the U. S. Department of Agriculture, is accompanying Dr. Dahlberg. Most of the travel will be by plane.

THE nineteenth Ludvig Hektoen Lecture of the Frank Billings Foundation will be delivered by Dr. Lloyd F. Craver, New York, on March 26, under the auspices of the Institute of Medicine of Chicago. The subject of the lecture will be "The Diagnostic Problems of Early Cancer."

DR. ALFRED BLALOCK, professor of surgery at the Johns Hopkins University School of Medicine and director of the department of surgery at the Johns Hopkins Hospital, will give on March 11 the tenth E. Starr Judd Lecture at the University of Minnesota Medical School. He will speak on traumatic shock with particular reference to war injuries.

DR. RICHARD C. TOLMAN, professor of physical chemistry and mathematical physics at the California Institute of Technology and dean of the Graduate School, gave a lecture on "Physical Science and Philosophy" at the meeting on February 27 of the Philosophical Society of Washington.

PROFESSOR L. C. DUNN, of the department of zoology of Columbia University, gave an illustrated address on "Mistakes in Development in Mice and Men" before the Four-College Genetics Conference at Smith College on February 18. He also spoke to the classes in genetics at Amherst and Smith Colleges.

DR. LAURENCE H. SNYDER, chairman of the department of zoology and entomology of the Ohio State University, addressed the Louisiana State University chapter of Sigma Xi on February 9 on "Heredity and Modern Life." On February 10 he spoke at a meeting of Beta Tau Mu on "The Mutant Gene in Man."

PROFESSOR VERNON L. FRAMPTON, of the department of plant pathology at Cornell University, will deliver a series of lectures during March and April on "Colloid Chemistry" at the National University of Colombia at Bogota. During the past several years he has made a study of the chemistry of viruses causing plant diseases.

DR. MARGARET MEAD, assistant curator of ethnology of the American Museum of Natural History, visited Iowa State College from February 16 to 18. She gave a public lecture on "National Character and International Cooperation" and spoke to various seminars and other groups.

THE annual general meeting of the American Philosophical Society will be held on April 22, 23 and 24, beginning at 10 A.M., on Thursday, April 22. The morning, afternoon and evening sessions on Thursday, April 22, will be devoted to a celebration of the two hundredth anniversary of the birth of Thomas Jeffer-

son. Carl Becker will deliver the Penrose Memorial Lecture on Thursday evening, April 22, on Jefferson's political philosophy with especial reference to the present. On Friday evening, April 23, Fiske Kimball will speak on "Jefferson and the Fine Arts." This will be followed by a musical program consisting of selections favored by Jefferson. On Saturday afternoon, April 24, at 2 o'clock there will be an illustrated lecture on "Historic Sites of Old Philadelphia," followed by visits to principal points of interest. The annual dinner on Saturday evening, at the Bellevue-Stratford Hotel, will commemorate the two hundredth anniversary of the proposal by Benjamin Franklin for forming the American Philosophical Society for promoting useful knowledge among the British Plantations in America. The Franklin Medal Lecture will be given on this occasion by Carl Van Doren on "The Beginnings of the American Philosophical Society." The sessions on Friday afternoon and Saturday morning will consist of papers by members and invited guests on various subjects. The annual executive session and election of officers and members will be held on Friday morning, April 23, at 9:30 o'clock.

THE cancellation of the annual meeting of the American Statistical Association in 1942 made it impossible to effect a change of officers by means of the customary election by the membership of the association. At its first meeting in 1943 the board of directors of the association accepted the resignations of the 1942 officers and appointed to the vacant offices the candidates proposed by the nominating committee. The officers of the association for 1943 are: E. A. Goldenweiser, *President*; C. I. Bliss, William G. Cochran, Roy L. Gillett, A. Ford Hinrichs, Walter Mitchell, Jr., Frank M. Surface, Donald B. Woodward and Theodore O. Yntema, *Vice-presidents*; R. L. Funkhouser, *Secretary* and *Treasurer*. Henry B. Arthur, Theodore H. Brown, Simon Kuznets and Alfred J. Lotka were appointed members of the board of directors.

DR. E. BRAUN-MENENDEZ, *Secretary*, and Dr. B. A. Houssay, *President*, of the third Pan American Congress of Endocrinology, have written as follows to Dr. Robert A. Lambert, associate director of the Rockefeller Institute: "This is to let you know that the Executive Committee of the Third Pan-American Congress of Endocrinology has decided to postpone *sine die* the realization of this congress. We wished to give the congress a real importance, but the absence of the lecturers appointed and of many other outstanding scientists would diminish the rank and dignity we think it should have."

THE three hundred and ninety-fifth meeting of the American Mathematical Society will be held at Hunter College on Friday and Saturday, April 23 and 24.

Sessions will begin on Friday morning and continue until noon on Saturday. The following addresses will be given by invitation of the program committee: "Spectral Theory," by Professor Nelson Dunford, of

Yale University, on Friday afternoon; and "Absolutely Convergent Trigonometric Sums," by Professor R. H. Cameron, of the Massachusetts Institute of Technology, on Saturday morning.

DISCUSSION

THE TRIPLE POINT OF WATER

In a survey of ten current text-books on physical chemistry, it was found that in only one of the eight which gave data on the triple point of water was the correct value for the temperature given. The usual value given is $+0.0075^{\circ}\text{C}$, which is that in the International Critical Tables.¹ This is actually the difference between the triple point temperature and the temperature at which ice and pure water are in equilibrium under one atmosphere total pressure. More recently this difference in temperature has been established experimentally^{2,3} as 0.0074°C , and it can be calculated from the Clausius-Clapeyron equation of thermodynamics.^{3,4} But the equilibrium temperature of ice and pure water at one atmosphere pressure is not zero degrees Centigrade.

In 1927, at the international Seventh General Conference of Weights and Measures, it was agreed that $0^{\circ}\text{Centigrade}$ be defined as the temperature at which ice and air-saturated water are in equilibrium at one atmosphere total pressure.⁵ Saturation of water with air lowers the equilibrium temperature by 0.0024°C .^{2,3,4} The total difference in temperature between this as 0°C (on the International Scale defined at this conference) and the triple point is then $.0024 + .0074$, and the triple point temperature is $+0.0098^{\circ}\text{C}$ (International).⁶

The vapor pressure of the liquid is usually defined as the pressure exerted by the pure vapor in equilibrium with pure liquid when the liquid is under no pressure except that of its own vapor; a similar definition is given for the vapor pressure of the solid. At the triple point, the vapor pressures of liquid and of solid are identical, but they decrease at different rates as the temperature is decreased. Therefore they are not identical at a temperature of 0°C , as most tables imply.⁷ Usually, in calculating the vapor pres-

sure of the solid, it is equated to that of the liquid at 0°C , instead of at the triple point.^{8,9} There are thus inconsistencies in the values given for the vapor pressures of solid and of liquid near 0°C . The differences are small but appreciable.

The pressure exerted by the vapor in equilibrium with the liquid under various conditions not only changes with temperature, but also changes slightly if an excess pressure is exerted on the liquid phase, and if substances are dissolved in the liquid. The pressure exerted by the vapor in equilibrium with the solid behaves similarly. Liquid and solid water may exist in equilibrium, with equal but varying vapor pressures over a range of conditions, if these conditions are properly varied.

In addition to the triple point, two other equilibria are of interest. Pure liquid and solid are in equilibrium under one atmosphere total pressure at $+0.0024^{\circ}\text{C}$, and air-saturated liquid and solid are in equilibrium under one atmosphere total pressure at 0°C . The vapor pressure will be different in each of these three equilibrium states. The triple point pressure is the vapor pressure of liquid water or of ice (under only its own vapor pressure) at the triple point temperature. The difference between this and the vapor pressure in these other two states may be calculated by considering the variation as made up of the sum of three separate effects.

First, as noted above, the vapor pressures of solid and liquid decrease with a decrease in the temperature. Second, the vapor pressure of a liquid or solid (a condensed phase) is increased if a pressure is exerted on the condensed phase alone and not on the vapor. For example, if air pressure is exerted on a condensed phase, the vapor is not itself compressed since it can mingle freely with the air. This gives an excess pressure on the condensed phase. Third, the dissolving of air in the liquid lowers the vapor pressure of the liquid. We may assume air is insoluble in ice, or at worst that its solubility is so small as to have a negligible effect on the vapor pressure. The first and third effects tend to cancel the second, in our particular examples.

⁸ E. W. Washburn, *Monthly Weather Review*, 52: 488-490, 1924; these calculations were made for, and are incorporated in, reference 7.

⁹ J. E. Goff, *Heating, Piping and Air Conditioning*, 14: 121-124, 1942. Dr. Goff has recently informed me that this correction was allowed for, although not explicitly stated in his paper.

¹ "International Critical Tables," Vol. IV, p. 11. McGraw-Hill, New York, 1928.

² H. Moser, *Ann. der Physik*, (5), 1: 341-360, 1929; quoted in references 3 and 4.

³ J. A. Beattie, T. C. Huang and M. Benedict, *Proc. Amer. Acad. Arts and Sciences*, 72: 137-155, 1938.

⁴ N. E. Dorsey, "Properties of Ordinary Water-Substance," p. 604. Reinhold Publishing Corporation, New York, 1940.

⁵ G. K. Burgess, *Bur. Standards Jour. Res.*, 1: 635-640, 1928.

⁶ See also B. P. Veinberg, *Jour. Exptl. Theoret. Phys.* (U.S.S.R.), 9: 106-113, 1939, quoted in *Chemical Abstracts*, 33: 7655, 1939; he selects $+0.0099^{\circ}\text{C}$ as the best value.

⁷ E.g., "International Critical Tables," Vol. III, p. 211.