

dean of the Medical School of the University of Buffalo, died on December 8 at the age of seventy-two years. Dr. Williams was appointed professor of pathology and bacteriology at the Medical School in 1894 and was a member of the faculty for forty years, retiring in 1934.

DR. JOHN DOUGLAS, clinical professor of surgery at New York University, consulting surgeon, died on December 5 in his sixty-fourth year.

DR. PORTER W. SHIMER, consulting chemist, president of the Shimer Chemical Company, died on December 6 at the age of eighty-one years.

THE division of botany of the University of Cali-

fornia at Davis held on November 30 a special seminar commemorating the one hundredth anniversary of Schleiden and Schwann's formulation of their cell theory. Dr. T. I. Storer briefly reviewed their work and the investigations of other men which led up to the cellular concept. The importance of the cell theory in present-day studies of bacteriology, physiology, genetics and plant pathology was discussed by Drs. C. S. Mudge, Max Kleiber, F. N. Briggs and W. B. Hewitt. The publications of many pioneer cytologists were on exhibit. Microscopic demonstrations illustrating important discoveries and plants and animals used by various cytologists were arranged by members of the departments of botany and zoology.

SCIENTIFIC NOTES AND NEWS

THE Gold Medal of Achievement for 1938 of the Poor Richard Club of Philadelphia has been awarded to Dr. David Sarnoff, president of the Radio Corporation of America and chairman of the board of the National Broadcasting Company. The medal will be presented to Dr. Sarnoff at the annual banquet to be given on January 17, the birthday of Benjamin Franklin. The award is made annually to a person whose accomplishments "have materially helped advance American civilization and raised the standards of living of Americans."

THE Penrose Medal of the Society of Economic Geologists has been awarded to Reno H. Sales, chief geologist of the Anaconda Copper Mining Company. The presentation will be made at the annual dinner of the society to be held on February 14 at the Harvard Club, New York City.

At the New York meeting on December 6 of the American Society of Mechanical Engineers the Holley Medal for "meritorious services in the development of the steam turbine" was presented to Francis Hodgkinson, honorary professor of mechanical engineering at Columbia University and formerly an associate of George Westinghouse. The Holley Medal previously has been awarded to the following men: 1924, Hjalmar Gotfred Carlson; 1927, Elmer Ambrose Sperry; 1929, Baron Chuzaburo Shiba, of Japan; 1934, Irving Langmuir; 1936, Henry Ford; 1937, Frederick G. Cottrell. Lawford H. Fry, of Pittsburgh, received the Worcester Reed Warner Medal for written contributions to improved locomotive design and to the utilization of better materials in railway equipment. Alphonse I. Lipetz, of the American Locomotive Company at Schenectady, received the Melville Medal for a paper entitled "Thin Air Resistance of Railroad Equipment"; Wilfred E. Johnson, of Fort Wayne, received the Pi Tau Sigma Medal, and Arthur C. Stern, of New York City, received the Junior Award of the society.

DR. ELLIOTT C. CUTLER, Moseley professor of surgery at Harvard University and chief surgeon at the Peter Bent Brigham Hospital, Boston, was awarded on November 22 an honorary doctorate by the University of Strasbourg, France.

DR. CARL J. WIGGERS was honored by his associates at a surprise tea on the afternoon of November 23 to celebrate the twentieth anniversary of his appointment as professor of physiology at Western Reserve University School of Medicine. On this occasion Dr. Wiggers was presented with a book of photographs and letters of appreciation from the president of the university, the dean of the School of Medicine, members and former members of the staff of the department of physiology and students who had worked under him.

DR. J. EDMUND WOODMAN, professor emeritus of geology in the New York University College of Engineering, was the guest of honor at a dinner given on December 10 by his former graduate students at the Faculty Club in recognition of his twenty-nine years of service on the faculty. Dr. Woodman was head of the department of geology from 1927 until his retirement this autumn.

THE Student Branch of the American Institute of Chemical Engineers at the Ohio State University entertained Dr. Edgar C. Bain, assistant to the vice-president in charge of research of the U. S. Steel Corporation, New York City, at a dinner meeting on November 18. The dinner was attended by seventy-five members of the student branch and officers of the Central Ohio Section of the American Society of Metals and the national secretary, W. H. Eisemann. Following the dinner, Dr. Bain made an address on the theoretical and practical problems of modern steel development from a metallurgical point of view. The new colored motion picture of steel manufacture by the U. S. Steel Corporation was exhibited.

ALEXANDER G. CHRISTIE, professor of mechanical engineering at the Johns Hopkins University, was inducted into office as president of the American Society of Mechanical Engineers at the fifty-ninth annual meeting held in New York City. The ceremony of induction, held in the presence of the society's council, consisted in the formal transfer of the gavel by the retiring president, Dr. Harvey N. Davis, president of Stevens Institute of Technology, and a short inaugural statement by Professor Christie.

OFFICERS of the American Pharmaceutical Association have been elected as follows: *President-elect*, Dr. A. G. DuMez, Baltimore; *First Vice-president*, F. O. Taylor, Detroit; *Second Vice-president*, F. J. Cermak, Cleveland; *Members of the Council*, H. C. Christensen, Chicago, Ill.; R. P. Fischelis, Trenton; Ernest Little, Newark. These officers will be installed at the next annual meeting of the association, which will be held in Atlanta, Ga., the time to be announced later.

DR. CLYDE L. CUMMER, assistant clinical professor of dermatology and syphilology at the School of Medicine of Western Reserve University, was reelected director and treasurer at the St. Louis meeting of the American Academy of Dermatology and Syphilology.

THE title of professor emeritus of chemistry has been conferred by the University of London on Dr. Samuel Smiles on his retirement from the Daniell chair of chemistry at King's College.

DR. TIFFENEAU, professor of pharmacology and materia medica, has been elected dean of the Faculty of Medicine of the University of Paris.

DR. D. R. PORTER, associate professor of truck crops at the College of Agriculture at Davis of the University of California, will conduct research for the Campbell Soup Company with headquarters in New Jersey. He will be concerned with vegetable breeding for quality and disease resistance.

WILLIAM B. COLEMAN, consulting chemist and metallurgist of Philadelphia, has been appointed a member of the membership committee of the Franklin Institute.

DR. JOHN WENDELL BAILEY, professor of biology at the University of Richmond, Va., is on leave for the current academic year. He is serving as director of biological research for the Chesapeake Corporation, manufacturers of kraft paper, at West Point, Va. Dr. Carl W. Hagquist, of Brown University, is teaching Professor Bailey's classes in zoology.

DR. ARTHUR B. CLEAVES has been granted leave of absence from the Pennsylvania Topographic and Geologic Survey to accept an appointment as geologist for the Pennsylvania Turnpike Commission, which is en-

gaged in building the new "super highway" across southwestern Pennsylvania.

DR. PHILIP A. MUNZ, professor of botany at Pomona College at Claremont, Calif., sailed on December 2 from New Orleans to spend several months studying the evening primrose in South America.

At the annual meeting of the trustees of the Josiah Macy, Jr., Foundation, held on December 6, two new members of the board were elected: Dr. Stanhope Bayne-Jones, dean of the Yale School of Medicine, and Dr. Charles Sidney Burwell, dean of the Harvard Medical School. Other members of the board are: Robert E. Allen, Dr. John Dewey, Dr. Harry Emerson Fosdick, William W. Hoppin, Dr. Ludwig Kast, Dave Hennen Morris, Lawrence Morris, Dr. Willard C. Rappleye, Dean Sage, Paul H. Smart, Edwin S. S. Sunderland, Dr. Samuel Trexler and J. Macy Willets. The following officers were reelected: The Hon. Dave Hennen Morris, *chairman*; Dr. Ludwig Kast, *president*; J. Macy Willets, *secretary*; Robert E. Allen, *treasurer*. Lawrence K. Frank, formerly assistant to the president, was appointed vice-president. At this meeting it was announced that Mrs. Walter G. Ladd, who established the foundation in 1930 in memory of her father, had made a substantial gift in further support of the work of the foundation. During the present year the foundation has made grants aggregating \$175,420 to thirty institutions in the United States and in Europe, in support of medical research.

AN Empire Rheumatism Council Research Foundation, to work in cooperation with the Admiralty to investigate the causes and the best means of prevention and treatment of rheumatic disease in the training establishments of the Royal Navy, has been established in Great Britain. The Research Advisory Committee has appointed a special *ad hoc* subcommittee, consisting of Lord Horder, Sir William Willeox, Professor Geoffrey Hadfield, Dr. Mervyn Gordon and Dr. W. S. C. Copeman, to supervise the work generally. Dr. C. A. Green, of the department of bacteriology of the University of Edinburgh, will take direct charge of the foundation. The Sir Halley Stewart Trust has granted him a research fellowship for three years for this task. He will be assisted by other permanent workers as and when found necessary. Every factor in the problem—bacteriological, biochemical and environmental—will be investigated at the chief naval training establishments.

DR. REGINALD A. DALY, Sturgis-Hooper professor of geology at Harvard University, lectured in the department of geology at the Ohio State University on the afternoons of December 1 and 2 and before the Society of Sigma Xi at the Ohio State University on

the evening of December 1. The subjects of the lectures were "New Facts in Physical Geology," "The Problem of Isostasy" and "Deep-sea Canyons."

DR. SAM F. TRELEASE, professor of botany at Columbia University, gave an address entitled "Selenium Poisoning on the Great Plains" on December 14 at the university before the Kappa chapter of Sigma Xi.

DR. SAMUEL H. WILLIAMS, professor of biology at the University of Pittsburgh, will deliver the annual lecture of the chapter of Sigma Xi of the University of Maryland on January 11. Dr. Williams, who spent the summer in Haiti, will speak on "Some Aspects of Tropical Research."

PROFESSOR F. LONDON, of Duke University, lectured at an open meeting of the Purdue University Chapter of Sigma Pi Sigma, the physics honorary society, on November 28, on "The State of Liquid Helium near Absolute Zero."

DR. WILLIAM BOYD, professor of pathology and bacteriology in the University of Toronto, gave a Mayo Foundation lecture on December 1 at the Mayo Institute. His subject was "Some Reasons for the Recent Increase in Bronchial Carcinoma."

THE twenty-third Guthrie Lecture was given before the British Physical Society by Dr. A. V. Hill, Foulerton research professor of the Royal Society, on November 11 at the Imperial College, London. The subject of the lecture was "The Transformations of Energy and the Mechanical Work of Muscles."

DR. J. B. S. HALDANE, professor of genetics at University College, London, delivered the Lloyd Roberts Lecture on "Some Problems of Human Congenital Disease" at the Royal College of Physicians of London on November 17.

A NEW hall for the exhibition of Dinosaurs was opened at the Academy of Natural Sciences, Philadelphia, on November 17. It was designed and arranged by a committee of which Rodolphe M. deSchauensee was chairman. Harold T. Green supervised the technical installation and Dr. Benjamin F. Howell, curator of geology and paleontology, was scientific adviser. The opening of the hall was preceded by an illustrated lecture given by Bradford Washburn, of the Harvard School of Geographical Exploration.

THE Rose Memorial Observatory at the Nebraska Wesleyan University, which was dedicated in the spring, is a brick and concrete structure housing a six-inch equatorially-mounted refractor in the dome, with an additional room for the meridian transit instrument, clocks and chronograph. A basement room is provided, in which it is planned later to install

seismographic equipment. The building is the gift of alumni and friends in honor of the late Charles Dunham Rose, who served the institution for thirty-seven years as professor of mathematics and astronomy.

AN Industrial Fellowship in Air Filter Research has been established at the Mellon Institute, Pittsburgh, Pa., by the American Air Filter Company, Inc., of Louisville, Ky. This fellowship will investigate broadly materials of value in the construction of filters for air-conditioning systems and will have the direct cooperation of specialists on the staff of the multiple industrial fellowship on air hygiene in operation in the institute. Dr. Frank F. Rupert, who has been appointed to the fellowship, has been a member of the institute since 1913 and has been associated with the fellowship in air hygiene for the past three years.

DR. E. PORTER FELT, director of the Bartlett Tree Research Laboratories, Stamford, Conn., has presented a plaque to the Massachusetts State College at Amherst, to be affixed to the present mathematics building, marking that building as the original home of economic entomology at the college.

THE first number of the *Science Observer*, a new publication addressed primarily to the school children of the nation, has been issued. The publication is part of the program of junior activities of the American Institute of the City of New York, with the aim of encouraging the interest of high-school students in science. Although issued as the official newspaper of the Science and Engineering Clubs sponsored by the American Institute, the *Observer* is expected to have a wide appeal among adults. The publication is an eight-page newspaper, tabloid size, containing four pages of news of science and club work and four pages of photographs.

Science Notes, published by the College of Natural Science, Yenching University, Peiping, China, states that the fourth annual report on the Ceramics Project has been published, reviewing the work carried out during the past year under the British Boxer Indemnity grant for ceramics research. The work includes studies on base exchange in clays, glaze suspensions and the experimental production of ceramic ware on a semi-commercial scale. This project is under the direction of Dr. E. O. Wilson. The report is issued in both English and Chinese. A chemical study of methods of composting as applied to the raw materials available in North China, subsidized by the Rockefeller Foundation, is entering upon its third year. The work with experimental stacks at Cheeloo University was suspended last year, but arrangements

are now being made to continue it. The chemical work is under the direction of Dr. S. D. Wilson and the biological and parasitological phases are being conducted by Dr. G. F. Winfield, of Cheeloo University.

At the University of Oxford a statute has been promulgated amending the provisions of the statutes governing the study of forestry. The object of the proposed statute is to simplify and to render more coherent the organization of the study of forestry by merging the School of Forestry and the Imperial Forestry Institute under a single control, and thereby to enable the university to make a more valuable contribution to forestry work throughout the empire. Under the new statute the department of forestry will be under the direction of the professor of forestry, and one central committee will provide for the instruction and supervision of four classes of students. These will be (a) forest service probationers; (b) forest officers taking refresher courses; (c) undergraduates who have taken honors in honor moderations in natural science and graduates or undergraduates who have taken honors in a final honor school;

and (d) candidates working for the diploma in forestry. This same committee will also provide for the higher training of forest officers and for the conduct of research into the formation, tending and protection of forests.

THE boundary of Hawaii National Park, Hawaii, has been authorized to be extended eighty-six square miles, as the result of an act at the last session of Congress. Besides authorizing the addition of lands in the so-called Kalapana and Footprint area to the park, the act also authorizes the acquisition of additional lands adjacent or contiguous to the existing park for the purpose of rounding out its boundaries. The act permits the United States to accept title by donation or gift, but prohibits the expenditure of Federal money for the purchase of land. Included in the 86 square miles of land authorized to be made part of the park are 12 miles of ocean shore line and areas of historic, archeological and scenic interest. Hawaii National Park was created in order to preserve the volcanic exhibit existing on the twelve islands that comprise the Hawaiian group.

DISCUSSION

WHAT IS SOIL?

RECENT references to the culture of plants in sand, cinders or gravel to which solutions of nutrient salts are added as "soilless crop production" have caused confusion as to the differences between hydroponics and non-hydroponic culture. This raises the question, "What is soil?" While soil scientists are not agreed as to all the physical, chemical and biological characteristics of the earth's surface that are to be included in the term, nevertheless they and the farmers are agreed that soil is ground or foundation in and on which plants grow if water and plant food are available. This foundation is a more or less porous solid that holds water as thin films around various-sized particles. This distinguishes soil, ground or foundation from that part of the earth's surface in which water is not so held. Thus to use the term "soilless" in any connection that ignores this fundamental difference between porous solids and liquids has no justification.

To contend that when sand, cinders or gravel have been treated and all plant nutrients removed they are therefore "soilless" and that the subsequent additions of nutrients thereto still retain these materials in such state ignores basic differences of properties that must be considered in classification. One would not contend, that when the soil solution of a fertile field has become virtually depleted of available nutrients by the growing of a crop, consequently could not sustain another crop until nutrients have been restored by

whatever way this may be accomplished, the nutrient-depleted field is in a "soilless" state. The presence or absence of one or all nutrients held in solution or otherwise in a porous solid does not differentiate categorically between the soil and soilless state of culture media.

The quantity of nutrients in a culture medium reflects fertility or crop-producing potentiality. However, as other conditions are essential to growth of crops, therefore fertility of any culture medium must be considered in a relative sense whenever comparison is made. The insoluble particles of soil are not involved in its fertility. This is a function of the character of the soil solution. The insoluble character of a part of the soil certainly is not a basis for defining such material as "soilless." Insoluble material is an essential part of soil.

Soil is a means of providing vegetation with nutrients and as long as they are incorporated therein are part of the soil. The elimination of available nutrients therefrom, however, does not alter the basic physical and geologic character of the earth's crust described as soil. But soils are not studied as a geophysical science. Soils have a biologic meaning. It is the relation of the earth's crust to vegetation that determines the scope of the concept implied in the term.

The basic difference between the soil and soilless types of culture media is in the mobility of the solutions they hold and retain. In the one case the solution