oped in the beginning of this century at Cambridge for an edition of Newton's works failed: " . . . As time passed it became clear, to me at any rate, that a committee of editors could not be very effective, especially when it consisted of men primarily intent each on his own scientific pursuits. Thus no effort has since been made to push the project. . . . But one may be permitted to express the view that a systematic collection of the letters remains most desirable, and the hope that some day that part of the scheme may be realized." It may be recalled that even the hope to form in England a Newton Society has been given up, too, according to the late Professor H. H. Turner.

A comprehensive and critical edition of Newton's correspondence must, of course, include all the memoirs written under the form of letters to Oldenburg, and published in the *Philosophical Transactions,* very often with alterations and omissions, the letters by Newton's correspondents, extracts from the letters of contemporaries which concern him, and his own letters, of which those now known number something less than 250. The Adam-Tannery edition of Descartes' correspondence is perhaps the best model to be followed. The realization of this project would no doubt constitute by far the most important contribution to the celebration in 1942 of the tricentenary of the birth of Newton.

SCIENTIFIC NOTES AND NEWS

PLANS have been completed by the Association of Illinois Chemists for having portraits painted of Professor A. W. Palmer, who was head of the chemistry department at the University of Illinois from 1894 to 1904, Professor W. A. Noyes, director of the chemical laboratory from 1906 to 1926, and Professor S. W. Parr, in charge of applied chemistry from 1894 to 1926. These men stand out, not only as leaders among American chemists, but also as the individuals who have done most to develop a successful chemistry department at the university. The portraits will be hung in the Chemical Library as an inspiration to all the younger students in chemistry. Dr. N. W. Krase is secretary of the committee.

MR. PHILIP DRINKER, assistant professor of ventilation and illumination in the school of public health of Harvard University, and Louis Agassiz Shaw, also of the school of public health, have been awarded the John Scott Medal for the invention of the Drinker respirator. Presentation of the medals will be made in the hall of the Franklin Institute on November 12.

IN celebration of Dr. Walter Bradford Cannon's twenty-five years as George Higginson professor of physiology in Harvard University, the afternoon and evening of October 15 have been set aside for exercises befitting the occasion, at the Amphitheater, Building C, Harvard Medical School, at 4 P. M., with Dr. David L. Edsall presiding. Papers will be given by Dr. Walter C. Alvarez, of the Mayo Clinic, on "Influence of Dr. Cannon's Work upon Medical Thought and Progress" and by Dr. William H. Howell, of the Johns Hopkins School of Hygiene, on "The Development of Physiology during the Past Twenty-five Years, and Dr. Cannon's Influence upon It." At 7:30 P. M. a dinner will be given at the Vanderbilt Hall Gymnasium, at which President Lowell will preside. Dr. Graham Lusk, professor of physiology of the School of Medicine of Cornell University, will speak on "The Life of a Professor." The presentation to the medical school of the portrait of Dr. Cannon will then take place. The committee in charge are: Dr. Henry A. Christian, *chairman,* Dr. Harvey Cushing, Dr. Alexander Forbes, Dr. Alfred C. Redfield and Dr. Cecil K. Drinker.

SIR HUBERT WILKINS, well-known Arctic explorer, was presented with a gold medal and diploma of the Italian Royal Geographical Society on July 23 on board the *Nautilus,* in recognition of his services to science in connection with polar research work.

THE American Astronomical Society has elected the following new officers besides the president, Dr. W. S. Adams, whose election was announced in SCIENCE last week: *vice-president,* Dr. C. G. Abbot, director of the Astrophysics Observatory of the Smithsonian Institution; *councillors,* J. C. Hammond, astronomer at the U. S. Naval Observatory, P. W. Merrill, astronomer at the Mt. Wilson Observatory, and H. H. Plaskett, director of the Dominion Observatory of Canada. Benjamin Boss, director of the Dudley Observatory, was reelected treasurer, and R. S. Dugan, professor of astronomy at Princeton University.

DR. ISAIAH BOWMAN, of New York, director of the American Geographical Society, has been elected president of the International Geographical Union at its closing session in the University of Paris on September 24. The next meeting of the union will be held in Warsaw in 1934. General Robert Bourgeois, of France, was elected first vice-president. General Vaccheli, of the Military Geographical Institute at Florence; Professor E. Romer, of the University of Lvov, Poland; Brigadier Harold Winterbotham, director-general of the Ordnance Survey of Great Britain; Professor Nunez, of Spain, and Sir Ahmed Mohamed, of Egypt, were elected second

vice-presidents. The congress was attended by more than 800 delegates from thirty-four nations, including fifty delegates from the United States. The meeting closed on the evening of September 24 after a banquet was given to the leaders of the delegations and a reception to delegates.

DR. JAY F. SCHAMBERG, professor of dermatology and syphilology in the Graduate School of Medicine at the University of Pennsylvania and director of the Dermatological Research Institute in Philadelphia, was installed as president of the Philadelphia County Medical Society on September 23. He gave the presidential address of acceptance, and an oration was delivered by the retiring president, Dr. George P. Muller, professor of clinical surgery in the medical school of the University of Pennsylvania. Other officers installed were: Dr. Charles F. Nassau, clinical professor of surgery at Jefferson Medical College, as president-elect; Dr. W. Burrill Odenatt, vice-president; Dr. Henry G. Munson, secretary, and Dr. R. Powers Wilkinson, treasurer. Associate vice-presidents who take office are Dr. L. C. Hamblock, Dr. C. Fisher, Dr. E. Paul Reiff, Dr. William H. Chandlee, Dr. Francis V. Gowan and Dr. Samuel Cohen. Dr. George C. Yeager, recently elected vice-president of the American Medical Association, Dr. Francis Ashley Faught and Dr. Nathan Blumberg are the newly elected members of the board of directors.

DR. ARTHUR W. GOODSPEED, professor of physics in the college at the University of Pennsylvania and director of the Randal Morgan Laboratory of Physics, has retired at the age of seventy-one years. Dr. Goodspeed has been connected with the university since 1884. Other retirements include Dr. Albert E. Roussel, professor of medicine, and Dr. James E. Talley, professor of cardiology.

DR. J. PAUL VISSCHER has been appointed professor and head of the biology department at Western Reserve University.

DR. DOUGLAS R. DRURY, of Harvard University and associate physician at the Huntington Memorial Hospital in Boston, has been made professor of physiology at the University of Southern California.

AT Lafayette College, John H. Wilson has been made professor of chemistry, and Professor Paul B. Eaton head of the department of mechanical engineering. Those advanced to the rank of associate professor are: James H. DeLong, in chemistry; Harry A. Itter, in geology, and Ernest M. Fernald, in mechanical engineering. Instructors promoted to the rank of assistant professors are: Charles K. Cabeen, in geology; William Beverly, in mathematics; Charles M. Merrick, in mechanical engineering. The following instructors have been appointed: Robert J. Crosen, in chemistry; Charles T. Brown, in physics; Harry L. Anthony, in mining engineering, and Paul P. Price, in civil engineering.

THE Pennsylvania State College has announced the appointment of the following department heads: Professor H. A. Everett, professor of thermodynamics, to be head of the department of mechanical engineering; Dr. Harry B. Northrup, formerly acting head of the department of metallurgy, to be head of the extension division of the school of mineral industries; Dr. Albert W. Gauger, formerly head of mines and mining experiments at the University of North Dakota, to be director of mineral industries research and professor of fuel technology.

ADDITIONS to the faculty of George Washington University include: Dr. L. Edwin Yocum, assistant professor of botany; Dr. Albert Spear Hitchcock, professorial lecturer in botany; Dr. Herman Henry Kaveler, instructor in chemistry, and Paul Hugh Emmett, lecturer in chemistry. In the school of medicine, Lieutenant Commander Franklin Forman Murdoch, acting executive officer of the Naval Medical School, will become professor of tropical medicine, and Myron C. Waddell has been appointed instructor in anatomy.

DR. J. C. GEIGER, professor of epidemiology of the George Williams Hooper Foundation for Medical Research and the University of California Medical School, San Francisco, has been appointed health officer of the city and county of San Francisco, filling the vacancy created by the sudden death of Dr. William C. Hassler.

DR. JOHN M. NOKES, formerly of Nashville, Tennessee, has been appointed assistant professor of obstetrics and gynecology at the Medical School of the University of Virginia.

PROMOTIONS and appointments in the faculty at Jefferson Medical College have been announced as follows: Edward J. Klopp, professor of surgery; Thomas A. Shallow, professor of surgery; George Russell Bancroft, professor of physiological chemistry and toxicology; Charles F. Nassau and Arthur E. Billings, clinical professors of surgery; George A. Ulrich, clinical professor of obstetrics; Michael A. Burns, associate professor of nervous and mental diseases; Arthur J. Davidson, associate professor of orthopedic surgery; H. Hunter Lott, assistant professor of laryngology; A. Spencer Kaufman, assistant professor of otology; Benjamin P. Weiss, assistant professor of nervous and mental diseases; James R. Martin, assistant professor of orthopedic surgery; B. B. Vincent Lyon, assistant professor of medicine; Collin Foulkrod, assistant professor of obstetrics; Lorenz

P. Hansen, assistant professor of physiological chemistry.

DR. HELÆNE WASTL, of the University of Vienna, has been appointed as acting professor of physiology at the Woman's Medical College of Pennsylvania; Dr. Sarah I. Morris, assistant professor of clinical medicine at the University of Wisconsin, has been made acting professor of preventive medicine and physician to the students; Dr. S. Brandt Rose has been promoted to the chair of bacteriology, and also becomes director of the clinical laboratory of the hospital; Dr. Mary J. Evans will act as assistant laboratory director. Other appointments are: Dr. Beatrice Rettinger, chief resident physician of the hospital; Dr. William John Ryan, demonstrator in surgery; Dr. Allan P. Parker and Dr. Herbert H. Fritz, instructors in surgical anatomy; Dr. William T. Lemmon, instructor in surgery; Dr. Mary Elizabeth Howe, instructor in anatomy; Dr. Miriam Butler, assistant instructor in pediatrics.

DR. FLOYD DE EDS, formerly of the National Institute of Health of the U. S. Public Health Service, has been appointed senior toxicologist for the U. S. Department of Agriculture. He will be stationed in the department of pharmacology, Stanford University School of Medicine, San Francisco, to carry on investigation of chronic intoxications for the bureau of chemistry and soils.

DAVID TWOMEY has been made assistant professor of psychology and Peter J. McKane has been made assistant professor of physics, at Boston College.

DR. WILLIAM H. GAUGER has been appointed instructor in the department of chemistry and chemical engineering at the University of Maine.

DR. CAREY CRONEIS, of the University of Chicago, has recently been promoted from assistant professor to associate professor of geology. Dr. Croneis has also been appointed research associate of the Museum of Science and Industry in charge of designing the geology exhibits in the division of geology and mineral industries. This division, when completed, will comprise 23 rooms and will occupy approximately 70,000 square feet of floor space. Mr. Louis Frederick Hampel has also joined the staff of the museum as assistant curator of social sciences.

DR. ADRIAN J. PIETERS, who has been acting in charge of the division of forage crops and diseases of the U. S. Bureau of Plant Industry, has been appointed head of the division.

PROFESSOR J. F. WILSON, wool specialist of the University of California animal husbandry division at the branch of the College of Agriculture, at Davis, California, has been chosen chairman for the 1932 conference of animal husbandmen at Miles City, Montana. The position carries with it the western vice-presidency of the American Society of Animal Production.

DR. JOHN ELTON LODEWICK, professor of wood technology at the Virginia Polytechnic Institute, has been appointed chief of the forest-products section of the Pacific Northwest Forest Experiment Station, the Forest Service has announced. He succeeds W. H. Gibbons, who was chief of forest-products work at this station for many years and who recently has been transferred to the Washington, D. C., office of the U. S. Forest Service.

DR. D. T. RIES, who until its termination on July 1 was employed by the Plant Quarantine and Control Administration on the Mediterranean fruit-fly project at Orlando, Florida, has been appointed curator of entomology at the Cranbrook Institute of Science, Bloomfield Hills, Michigan.

DR. ALBERT KENRICK FISHER, senior biologist of the bureau of biological survey, U. S. Department of Agriculture, and for many years head of its division of economic investigations, was retired on August 31. Dr. Fisher now becomes a zoological collaborator of the U. S. National Museum.

THE Charles Sumner Bacon Lectures (third series) will be given on October 8 and 9 in Lecture Hall No. 221, at the University of Illinois College of Medicine, 1853 Polk Street, Chicago, by Dr. Herbert M. Evans, professor of anatomy at the University of California. The general subject of the lectures is "The Function of the Anterior Hypophysis." These lectures will be open to the public.

DR. E. D. ADRIAN, fellow of Trinity College, Cambridge, and Foulerton research professor of the Royal Society, will deliver the Eldridge Reeves Johnson Foundation Lectures at the University of Pennsylvania from October 13 to 28 on "The Mechanism of Nervous Action—Electrical Studies of the Neurone." The series will be given in the medical clinic of the university at 4:15 on the following dates: Tuesday, October 13, "The Nerve Fiber as a Means of Communication"; Wednesday, October 14, "The Sensory Message and Its Relation to the Stimulus"; Tuesday, October 20, "The Action of Different Sense Organs; Some Outstanding Problems"; Wednesday, October 21, "Impulses in Efferent Nerves: The Grading of Muscular Contraction: Sympathetic Discharges"; Wednesday, October 28, "The Activity of the Nerve Cells."

THE spring meeting of the American Electrochemical Society is scheduled for April 21, 22 and 23, 1932, at Baltimore, the home of the largest electro-

lytic copper refinery in the world. The headquarters of the meeting will be at the Lord Baltimore Hotel. The subject for the main scientific-technical session, at which Dr. J. T. MacKenzie will preside, will be "The Electric Furnace and its Products." Manuscripts on any phase of the electric furnace art are welcome and should be mailed to the secretary before February 15, 1932. The round table discussion will be under the direction of Mr. F. A. Lidbury, of Niagara Falls. The topic of the discussion will be "Electrochemistry and the Fertilizer Industry." There have been a number of very radical changes in the fertilizer industry during recent years and an opportunity will be afforded to all members and guests to express their views and recommendations in the round table discussion. The electrothermic division is inviting one of the foremost electric furnace engineers of Europe to report upon the recent developments in the electric furnace art abroad. Dr. Duncan MacRae, of the Edgewood Arsenal, is chairman of the local committee. Trips to various industrial plants are planned, among them being the U. S. Industrial Alcohol Company, the Baltimore Copper Works, the American Refractory Company and the Bethlehem Steel Company.

THE Roumanian Medical Association held its annual congress recently in Constanza, a picturesque seaport on the shore of the Black Sea. According to the Bucharest correspondent of the *Journal* of the American Medical Association, the congress was attended by more than 700 physicians, most of them accompanied by their families. The presidential address was given by Professor Hatiegan, the minister of Transylvania. Afterward Professor Cantacuzino read a paper on Calmette's vaccination. After the paper had been read, the president of the medical association, the professorial staff of the Roumanian universities, and the different medical formations, together with the delegates of the allied professions, solemnly greeted Professor Cantacuzino on the occasion of his appointment as minister of public health. The board of the medical association established a foundation, the annual interest of which, 10,000 lei, is to be given as a prize to the writer of the best dissertation emanating from the institute for the production of serums and vaccines, carrying the name of Professor Cantacuzino. A special committee was appointed with Professor Cantacuzino as president, to award the prize.

THE permanent committee of the International Union of Forestry Research Organizations met on September 7 at the office of the Forestry Commissioners, Savile-row, England. The committee prepared for the next meeting of the international union, which is to be held in France in 1932. The union comprises over eighty forest research organizations in thirty countries. The members of the committee present were: M. P. Guinier (France), president of the international union; Herr Sven Petrini (Sweden), secretary-general to the international union; Professor H. Badoux (Switzerland), director of the Swiss Central Institute for Research; Professor L. Fabricius (Germany), director of the Institute for Research at Munich; Professor Aldo Pavari (Italy), director of the Institute for Research at Florence, and Sir Roy Robinson (Great Britain), vice-chairman of the Forestry Commission. The representatives of Hungary and Poland were unable to be present. In the afternoon the committee visited Kew Gardens, and the members were the guests of H.M. Government at a dinner at the Hotel Splendide, when Lord Londonderry presided. Later the committee visited some of the state forest areas in the west of England and in Wales.

THE Royal College of Physicians of Edinburgh will celebrate on St. Andrew's Day, November 30, the two hundred and fiftieth anniversary of its founding. The charter of the society was granted by Charles II in 1681 to a group of young physicians under the leadership of Sir Robert Sibbald.

IT has been announced recently that the Association for the Advancement of Science in Marketing has been organized. Its object will be actively to encourage a scientific approach to marketing problems. The provisional officers are as follows: *President,* Paul T. Cherrington, distribution consultant; *first vice-president,* L. D. H. Weld, research director, McCann-Suckow, Inc.; *secretary,* N. W. Barnes, Marketing Associates, Inc.; *treasurer,* A. M. Crossley.

BOWDOIN COLLEGE has received $50,000 by the will of the late Edwin Bradbury Smith.

THE late Professor W. D. Halliburton, who died on May 21, has bequeathed, on the death of his wife, £10,000 to King's College, University of London, for endowment, or towards the salary of a professor in the subject of physiology or the sciences relating thereto.

DR. HENRY G. KNIGHT, chief of the U. S. Bureau of Chemistry and Soils, has announced that a new citrus laboratory, for which funds were appropriated by the last Congress, will be established in the citrus-growing territory of the Rio Grande Valley at Weslaco, Texas, on the state-owned land of the Texas State Experiment Station. The selection of the site was made upon recommendation of Dr. F. C. Blanck, who is in charge of the food research division of the Bureau of Chemistry and Soils, and E. M. Chace, of the bureau's fruit and vegetable laboratory at Los Angeles, California, and with the approval of Di-

rector A. B. Conner, of the Texas Agricultural Experiment Station.

DR. WILLIAM FRANCIS THOMPSON, director of investigations and professor of fisheries for the International Fisheries Commission at the University of Washington, has recently completed the preliminary studies called for by a treaty in 1924 between Canada and the United States establishing a commission for investigation of the halibut fisheries. As a result of these studies, a new treaty dealing with the regulation of the fisheries and continuing the scientific work has been signed and confirmed. This is said to be the first treaty for the conservation of a species of marine fish.

DISCUSSION

THE MEGAGAMETOPHYTE OF PINUS

THE classic work of Hofmeister presents the development of the megagametophyte of several gymnosperms which he studied in the years 1848 and 1849. He introduced for the first time the general course of events in the growth of the gametophyte of gymnosperms. Subsequent corrections in this life history appeared at intervals with the progressive improvements in the methods of histological technique. Hofmeister, influenced no doubt by his study of the life history of mosses and ferns, concluded that the megagametophyte of gymnosperms grows in a manner similar to that of the Fern Allies, as he knew of it in *Selaginella*. Up to the present time this conclusion in general has been accepted by most botanists.

That the gymnosperms and Fern Allies are closely related has been seriously questioned recently by workers in paleobotany and plant anatomy. This controversy concerning the phylogeny of gymnosperms brought forth the expression that the evidence obtained from a study of plant morphology is unreliable as an indicator of relationship. Unfortunately we have only a fragmentary knowledge of a few of these life histories and none are complete in every detail.

The description of the growth of the megagametophyte of *Pinus* as presented in current botanical literature is incomplete and inaccurate. Evidence of a centripetal growth of the gametophyte has not been found in any of the gymnosperms other than *Pinus*. In *Pinus* centripetal growth has been inferred but the progress for such a development has never been presented in detail. There is too little evidence to support the general rule that centripetal growth of the megagametophyte occurs in most of the gymnosperms. In a text-book of botany of recent publication, we find the growth of the megagametophyte conveniently arranged in five stages.

> The female gametophyte, in nearly all gymnosperms, develops in a general way as in *Selaginella* and *Isoetes*. At least five stages in the development should be borne in mind; (1) Free nuclear division by which a varying number of free nuclei are distributed through the cytoplasm of the megaspore; (2) Parietal placing of these nuclei by the development of a central vacuole; (3) Continued free nuclear division; (4) Formation of a parietal tissue by the development of cell walls separating the free nuclei; (5) Centripetal growth of this tissue until it fills the cavity of the enlarging megaspore which is now known as the embryo sac.

The proper view of the development of the megagametophyte of *Pinus*, as obtained by a study of a close series of *Pinus flexilis* and *P. scopulorum* collected in the Rocky Mountain National Park, Colorado, during the past three growing seasons, differs greatly from the present accepted description. The various phases of growth will be given in the order comparable to the five stages in the previous quotation. (1) After the megaspore mother cell has divided, the first cell of the gametophyte remains in the resting stage until the zone of nutritive cells (spongy tissue) becomes active. This nutritive tissue persists for a long time in the digestion of the nucellus. (2) As a result of the activity of the digestive tissue and the enlargement of the nucellus, a large vacuole is formed. The megagametophyte develops by free nuclear division in the center of the enlarging vacuole. (3) The cytoplasm surrounding the free nuclei remains connected in strands and the young gametophyte in the center of the vacuole takes on the form of a tangled skein or network. (4) A megagametophyte consisting of a separate parietal tissue surrounding a central cavity does not appear in normal sporangia. Nutritive cells in the final stages of digestion, however, are still present in a parietal position at the time archegonia first appear. (5) The normal growth of the gametophyte is centrifugal, never centripetal. The embryo sac is completely filled by the gametophyte at the time of fertilization or soon after.

In the development of a carpellate cone of *Pinus*, two or three years, depending on the species, are required for the seeds to reach maturity. During this time interval the number of abortive ovules gradually increases as development progresses. The carpels externally appear alike at maturity but the number of seeds in a cone may vary from a few to a hundred or more. The average number of mature seeds found