

over thirty years he helped every geologist who worked there. He made excellent collections of some groups of fossils and several species were named for him.

The editor of *Chronica Botanica* reports that, according to a telegram received from Singapore, the Botanical Gardens and the Raffles Museum are in a relatively good condition. R. E. Holtum, the director of the Botanical Gardens, and his associate, E. J. H. Corner, have been allowed to remain "free" during the years of Japanese occupation and were able to continue to run the affairs of the Botanical Gardens to a certain degree. W. Birtwistle, who was director of fisheries, remained also free and took care of the Raffles Museum, as well as circumstances permitted.

Dr. Herbert Shapiro writes that Dr. Jean Brachet, professor of embryology at the University of Brussels, who was in the United States during 1937 when he worked at Princeton University and the Marine Biological Laboratory, Woods Hole, has written a letter dated July 24, 1945, from which the following are quotations:

We are now slowly recovering from the bad days of the German occupation; fortunately we came through it alive and in fairly good state of health. . . . You perhaps know that I was arrested as a hostage and detained in a fortress for about three months in 1942-1943. I have now completely recovered and am back at work again. . . . I thought at a time of going back to the States but there seem to be many difficulties. . . . Could you ask scientific people you meet to send me reprints? I am particularly interested in chemical embryology, nucleic acids and cell physiology.

Letters from abroad received by Henry S. Conard, Grinnell College, Iowa, state that A. Conard (cytol-

ogy, retired, Brussels) is well and active. Anciaux (plant physiology, Brussels) is eager to see American publications in his field. J. Braun-Blanquet has carried on his work at the Geobotanical Institute at Montpellier, France, throughout the war, having some students and publishing papers. R. Tüxen, Hannover, is well and active. Lipmaa (Esthonia) and Malta (Latvia) were killed by bombs. J. Charrier, bryologist, Vendée, France, says conditions were not "too bad"; he is ready to resume correspondence and exchanges; naturally, travel has been greatly restricted.

Dr. Wm. Randolph Taylor, of the University of Michigan, writes that a letter just received from Dr. Th. Jos. Koster, of Leiden, states that Dr. J. Heimans, expert on desmids, was transported from the Netherlands to a German concentration camp, but has survived. The diatomist, Dr. A. van der Werff, and the freshwater phycologist, Dr. W. Beyerinck, are both reported to have escaped misfortune.

The Swedish morphological phycologist, Dr. Svante Suneson, has left Lund and is now at the H. a. Läroverket, Karlstad.

The Finnish marine phycologist, Professor Ernst Håyrén, writes that he is well and that the algal collections of the University of Helsingfors are intact and being reinstalled after evacuation.

The young Swedish student of the flora of running streams, Dr. G. Israelson, now at Stjärnhov, writes of his urgent desire to expand his contacts with American freshwater phycologists.

From a Swedish correspondent we learn that the noted Austrian marine phycologist, Professor Bruno Schussnig, has survived the war, but has left Vienna and lives at Altmünster under conditions of great hardship.

SCIENTIFIC NOTES AND NEWS

THE Theodore Roosevelt Distinguished Service Medals of Honor for 1945 will be awarded to Dr. Vannevar Bush, director of the Office of Scientific Research and Development, president of the Carnegie Institution of Washington, in recognition of "distinguished service in the field of science"; to Cordell Hull, formerly Secretary of State, and to General of the Army George C. Marshall, chief of staff. The presentation dinner, to be held under the joint auspices of the Roosevelt Memorial Association and the Women's Roosevelt Memorial Association, will mark the eighty-seventh anniversary of the birth of Theodore Roosevelt.

DR. ZAY JEFFRIES, vice-president of the General Electric Company in charge of its chemical department at Pittsfield, Mass., past president of the Ameri-

can Institute of Mining and Metallurgical Engineers, has been awarded the 1946 John Fritz Medal for "leadership in the solution of problems affecting the production, conservation, substitution and scientific appraisal of metals and alloys."

THE Henry Laurence Gantt Memorial Medal for "distinguished achievement in industrial management as a service to the community," awarded annually by a board composed of representatives of the American Management Association and the American Society of Mechanical Engineers, was presented to John M. Hancock, partner of Lehman Brothers, at a dinner meeting on October 10. William L. Batt, vice-chairman of the War Production Board, chairman of the board of directors of the association and president of Smith, Kline and French Industries, presided.

Mr. Hancock's address was entitled "One Unused Tool of Corporate Management."

COLONEL EARLE M. RICE, Medical Corps, executive officer, Tropical Medicine, Army Medical School, and Colonel Paul F. Russell, Medical Corps, chief, Division of Parasitology, Army Medical School, have been awarded the Legion of Merit.

DR. ANGELO M. DA COSTA LIMA, of the Instituto Oswaldo Cruz, Brazilian entomologist, on August 31 was awarded the degree of doctor of agronomy, *honoris causa*, by the Universidade Rural of Rio de Janeiro. Dr. Costa Lima is the author of "Insectos de Brasil," of which six volumes have been prepared and published. For this work, and by a government decree, he has received a monetary award of 140,000 cruzeros, with which sum he plans to travel in the United States, and if possible, also in England and on the Continent. In 1943, the Entomological Society of America elected him an honorary fellow; he being the first and only foreigner to receive this honor.

THE War Department recently presented a scroll to Columbia University in recognition of its contribution to research on the atomic bomb. It was accepted for the university by Dr. George Pegram, chairman of the University Committee on War Research and dean of the graduate faculties. Dr. Nicholas Murray Butler, now president emeritus of the university, gave the closing address at the ceremony. He singled out for special commendation Dean Pegram; Dr. Harold Clayton Urey, professor of chemistry; Dr. Enrico Fermi, professor of physics, and Dr. John R. Dunning, professor of physics.

OFFICERS of the American Society for Clinical Investigation for the year 1945-46 have been elected as follows: *President*, Thomas Francis; *Vice-president*, J. B. L. Browne; *Secretary*, E. A. Stead, Jr.; *Treasurer*, Robert Wilkins; *Councillors*, E. B. Ferris, Jr., John Lockwood and Maxwell Finland.

ROBERT E. WATERMAN, vice-president of Schering Corporation, Bloomfield, N. J., has been elected chairman of the North Jersey Section of the American Chemical Society. He succeeds Horace E. Riley, of the Bakelite Corporation, Bloomfield.

AT the annual meeting on October 6 of the Paleontological Research Institution, held at its headquarters in Ithaca, N. Y., the following officers were elected for the ensuing year: *President*, Ralph A. Liddle, Fort Worth, Texas; *Vice-president*, Axel A. Olsson; *Secretary*, Rebecca S. Harris; *Treasurer*, Gilbert D. Harris; *Assistant Treasurer*, Katherine V. W. Palmer. Owing to uncertainties of now obtaining suitable materials and labor for the construction of a new building referred to in the minutes of the last meeting, April 7, 1945, it was deemed best to post-

pone temporarily its construction. This condition, however, has not prevented satisfactory progress in the publication of the *Bulletin of American Paleontology* and *Paleontographica Americana*, nor has it delayed work on the Carpenter types.

DR. IRA S. BOWEN, professor of physics at the California Institute of Technology, has been appointed director of the Mount Wilson Observatory. He will succeed Dr. Walter S. Adams, who will retire on January 1, 1946, after serving as director since 1923.

DR. IRA L. BALDWIN, dean of the Graduate School of the University of Wisconsin, who from 1941 to 1944 was chairman of the department of agricultural bacteriology, has been made dean of the College of Agriculture.

DR. CHARLES P. ALEXANDER, professor of entomology and head of the department of entomology and zoology, has been appointed acting dean of the newly established School of Science at the Massachusetts State College.

DR. STEPHEN WINCHESTER DANA, geophysicist of the Standard Oil Company, has been appointed associate professor of geology at the University of Redlands. He will take up his new work during the present month.

DR. DAN STANISLAWSKI, of the University of California, has been appointed assistant professor of geography, specializing in Latin America, at the University of Washington, Seattle.

DR. F. GAYNOR EVANS, of the School of Medicine of the University of Maryland, and Dr. Ernest Dean Gardner, assistant professor of anatomy and acting head of the department of the School of Medicine of the University of Southern California, have been appointed to assistant professorships of anatomy in the College of Medicine, Wayne University, Detroit.

PROFESSOR A. W. ASHBY, who occupies the chair of agricultural economics at the University College of Wales at Aberystwyth, will succeed on January 1 Professor C. S. Orwin as director of the Institute for Research in Agricultural Economics at the University of Oxford.

DR. CORNELIUS P. RHOADS, director of Memorial Hospital, New York City, has been appointed director of the Sloan-Kettering Institute for Cancer Research, which is to be built as an integrated unit of the hospital. Alfred P. Sloan, Jr., whose gift of \$4,000,000 through the Alfred P. Sloan Foundation made possible the new institute, was elected chairman of the board and also chairman of the executive committee.

HUGO KLEIN has been advanced to the position of

vice-president of the Charles Bruning Company, Inc., in charge of chemical production and research.

DR. C. W. THORNTHWAIT, of the U. S. Soil Conservation Service, has recently returned to Washington from Mexico, where he had been on assignment to the Mexican Government for a period of several months. While in Mexico he worked with technical men in the Comision Nacional de Irrigacion and the Direccion de Geografia on hydrologic and climatologic problems.

DR. HARLOW SHAPLEY, director of the Harvard College Observatory, who was one of the official American delegates to the recent conference on the development of science held in Moscow under the auspices of the Soviet Government, gave a "Report on Soviet Science" at the meeting on October 10 of the American Academy of Arts and Sciences, Boston.

DR. ROY GRAHAM HOSKINS, research associate in physiology, Harvard Medical School; director of the Memorial Foundation for Neuro-Endocrine Research, Boston, and director of the Worcester State Hospital, as Salmon Memorial Lecturer for 1945 will deliver a lecture series entitled "The Biology of Schizophrenia," at 8:30 P.M. on the three successive Friday evenings of November 2, 9 and 16, at the Academy of Medicine, New York City.

THE subject discussed at the eighteenth annual Graduate Fortnight of the New York Academy of Medicine, which was held from October 8 to 19, was entitled "Contributions of the War Effort to Medicine."

A PRESS report states that a cablegram received by the Yale-in-China Office from the advance contingent of the Yale staff, which has now returned to Changsha, reports that fifteen buildings of the Yale-in-China campus at Changsha, Hunan Province, are in ruins and that many others are in need of repair.

THE thirty-third annual winter technical meeting of the Institute of Radio Engineers will be held at the Astor Hotel from January 23 to 26. The annual banquet at which a speaker of national prominence will address the members and their visitors, will be held on Thursday, January 24. Two annual awards will be made at the banquet: the Institute Medal of Honor, awarded in recognition of "distinguished service in radio communication," and the Morris Liebmman Memorial Prize, "to a member of the institute who has made public during the recent past an important contribution to radio communication." The annual president's luncheon, honoring the incoming president, will be held on Friday, January 25. Commercial exhibits will occupy one floor and part of another in the Astor Hotel. It is expected that one hundred and fifty firms or more will take part. This

will be the first trade showing of post-war radio equipment and parts.

THE Industrial Research Institute held its fall meeting on September 27 and 28 at the Hotel Pennsylvania in New York City. Over a hundred research directors and other industrial executives attended and discussed common problems of research management. Dr. Frank B. Jewett, president of the National Academy of Sciences and a former vice-president of the American Telephone and Telegraph Company, was the guest speaker at an informal dinner on the evening of September 27.

THE Twentieth Exposition of Chemical Industries will be held from February 25 to March 2 in the Grand Central Palace, New York.

THE twenty-seventh National Metal Exposition will be held in Cleveland from February 4 to February 8, 1946. It will again be held in conjunction with the National Metal Congress. Meeting at the same time will be the American Welding Society, the Iron and Steel and Institute of Metals divisions of the American Institute of Mining and Metallurgical Engineers and the American Industrial Radium and X-Ray Society. Many trade associations and groups in industry will also meet in Cleveland during the week.

THE American Telephone and Telegraph Company has announced the availability of its Frank B. Jewett Fellowships for a second year. These post-doctorate fellowships in the physical sciences, including chemistry, mathematics and physics, carry an award of \$3,000 to the fellow and an honorarium of \$1,500 to the academic institution where his research is pursued. The fellowships are open to both men and women who have obtained the doctorate or expect to receive it prior to the beginning of the term of twelve months, which opens on July 1, 1946. Requests for further information and applications should be sent to the Frank B. Jewett Fellowship Committee, Bell Telephone Laboratories, Inc., 463 West Street, New York 14, N. Y. Applications for the current term are returnable to the committee by December 1, 1945, and awards will be announced on February 1, 1946.

IT is planned that control of the Harvard University Solar Observatory near Climax be vested in a corporation to be operated jointly by Harvard and the University of Colorado. Boulder, Colo., will be the headquarters of the corporation, which plans to enlarge the observatory. The observatory has been making observations useful for long-range forecasts of the quality of radio transmission.

THE department of hygiene and bacteriology of Western Reserve University has been divided to form

a department of preventive medicine and public health and a department of bacteriology.

It is reported in *The Scottish Geographical Magazine* that in a memorandum issued by the Council of the British Ecological Society, the establishment is recommended of a permanent R.A.F. unit for scientific work and of a Central Library of Air Photographs. Work which could be undertaken with the help of aerial survey includes the survey of inaccessible

places, the periodic record of changing coast-lines, the distribution of land liable to flooding, the establishment of correlations between environment and vegetation, primary surveys of vegetation, the distribution of certain animal species, the study of aerial plankton, and so forth. Many of the results would be economically valuable, and the aerial unit would necessarily facilitate the development of methods of survey and photography and the maintenance of highly trained personnel.

SPECIAL ARTICLES

THE TOXICITY OF INFLUENZA VIRUSES¹

THIS investigation was initiated by the observation that intraperitoneal injection of certain allantoic fluids infected with various strains of influenza virus led to the death of some mice with characteristic lesions within 16 to 72 hours. Similar results were noted in a small series following intravenous administration of virus. On autopsy it was found that the blood vessels of extensive portions of the small intestines were engorged. Marked edema and distension of the gut was noted. The lumen of the duodenum, jejunum and ileum usually contained bloody mucous material which varied in color from pink to dark red. Occasionally small amounts of clotted blood were found in the stomach. The colon and rectum appeared normal, except in a few cases where petechial bleedings were observed throughout the length of the gastrointestinal tract.

The livers were usually of normal size with sharp edges. The surface showed a more or less distinct fine mottling, apparently caused by a pale yellow color of the periphery of the lobules while the centers retained their deep red color. The spleens were frequently enlarged and dark red. The lungs were generally normal in appearance at the early stages, but with increase of time between injection and death hyperemia and small areas of consolidation became visible in the case of some strains of the virus. Pleural exudate and ascites were not uncommon in animals which died 48 to 72 hours after injection.

Microscopically² the livers showed early widespread necrosis of the parenchyma in addition to marked hyperemia. Increased numbers of polymorphonuclear leucocytes were present. The spleens, likewise, were hyperemic and revealed distinct destruction of lymphocytes and necrosis of the Malpighian bodies in the earlier stages while after 48 hours the necrotic debris

had been largely digested and regeneration had begun. The intestines were hyperemic and edematous. Other organs, aside from hyperemia, did not show any distinct changes.

Death from these acute lesions rarely occurred later than 72 hours after injection. Some surviving mice developed jaundice, particularly following injection of the F-12 strain of influenza A.³ In these cases bilirubin was found in the urine, as determined by the Godfried modification of the Harrison spot test.⁴ When such mice were sacrificed the subcutaneous fat tissue was found to be bright yellow. The livers were yellowish brown in contrast to the normal reddish brown, and on histological examination showed diffuse and focal proliferation of lymphoid and reticulo-endothelial elements. Focal necroses showing practically no peripheral reactions were common. The Malpighian bodies of the spleen were large and swollen, and marked perivascular reticulo-endothelial proliferation was noted.

In the case of strains of influenza virus which produced a high incidence of the toxic signs, particularly the F-99 virus of influenza A,⁵ death from lung lesions became apparent from the 5th day on. These lesions were identical with those following intranasal inoculation. Other, less toxic strains, caused mild pulmonary involvement or none at all, as has been observed previously.⁶

These results were ascribed to the action of influenza virus for the following reasons: Bacteriological examination of peritoneal fluid, liver and heart's blood proved negative. A search for pathogenic organisms in the intestinal contents yielded some cultures which on peritoneal injection killed mice but none of these animals died with the lesions described.

The toxic reactions were obtained in 2 strains of

¹ The work described in this paper was done under contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Children's Hospital of Philadelphia.

² We are indebted to Dr. W. E. Ehrlich for reviewing the microscopic sections.

³ Isolated from the lungs of a fatal case of influenza. J. Stokes, Jr., and I. J. Wolman, *Internat. Clin.*, 1: 115-122, 1940.

⁴ E. G. Godfried, *Biochem. Jour.*, 28: 2056-2060, 1934.

⁵ Isolated from the lungs of an infant after a rapidly fatal respiratory infection.

⁶ E. R. Rickard and T. Francis, Jr., *Jour. Exp. Med.*, 67: 953-972, 1938.