metry and also controls the regenerative processes.

In 1915 Child published what I consider the most fruitful and outstanding of his books, a small volume entitled *Individuality in Organisms*. The essential thesis of this book is that the problem of the unity of the organism is the problem of correlation, and that correlation is achieved by anteroposterior dominance, which in turn is the expression of an anteroposterior gradation of physiological processes. In this book Child also developed the important concept of physiological isolation or escape from dominance, bringing forward a wealth of facts in support of these concepts.

The year 1915 also saw the publication of the important volume *Senescence and Rejuvenescence*. Later books, *The Origin and Development of the Nervous System* (1921) and *Physiological Foundations of Behavior* (1924), are of lesser value, in my opinion. Finally, in 1941, Child summed up his concepts and the experimental bases for them in the outstanding volume, *Patterns and Problems of Development*, which forms an essential guide to his philosophy of the organism.

Child spent most of his scientific career in a frontal attack on the fundamental biological problem: organization. He saw, as most of his zoological colleagues could not see, that the properties of the organism—its order, its unity, the correlative nature of its activities—cannot be explained by assigning powers to elementary particles, genes, or what not. Particulate theories fail to touch the essential problem, the characteristics of the organic individual, of which the chief one is integration. The problem of organismic integration is one of both pattern and material. Hereditary factors enter into the material, but the main pattern of organisms, the axiate pattern, is explicable as a gradient in the rate of physiological processes. Such axiate pattern is thought of as arising in the last analysis from the differential action of the external world on protoplasm, establishing a gradation.

Following his retirement in 1937 from the University of Chicago (to which he had come in 1895), Child continued, at Stanford University and its marine laboratory, his experimental work on the alteration of development by chemical means, a method he had long used as a means of analysis of the role of gradients in development. He was still pursuing this line of investigation at the time of his death.

Throughout his scientific career Child was notable for his whole-hearted devotion to fundamental problems of biology. He was entirely devoid of the personal ambition, the seeking for advancement, position, and fame, that mars the lives of many scientists. He ever adhered to the highest standards of scientific integrity and thereby won the respect of all who knew him. He was a great lover of the outdoors, especially of mountainous country, and throughout his life was wont to take the trail in the western mountains with his pack and photographic equipment, for he greatly enjoyed photographing scenes of natural beauty. He lived a good life, employing his mental faculties to their utmost in research and enriching himself by contact with unspoiled nature.

LIBBIE H. HYMAN
American Museum of Natural History, New York

News and Notes

Research on Semiconductors

Approximately 450 scientists from 20 countries met in Amsterdam, 29 June–3 July 1954, to discuss the latest results in semiconductor research. This second international conference on semiconductors (the first one was held at Reading, England, in June 1950) was organized by the Netherlands Physical Society and supported by the International Union of Pure and Applied Physics and UNESCO. The conference committee, headed by E. J. W. Verwey with H. J. Vink as secretary, was responsible for the extremely successful organization of the conference. A total of 65 papers was presented. The program was arranged to provide adequate time for formal and informal discussions and to give room for spontaneous reaction to the papers.

An introductory paper outlined the present scope of semiconductor research, and the conference closed with a lecture summarizing the papers presented. Although considerable interest was expressed in the various intermetallic semiconductors and the sulfides, selenides, and tellurides of lead and cadmium, the scope of the papers indicated continued emphasis on the elementary semiconductors, germanium and silicon.

The introductory lecture by H. B. G. Casimir (Eindhoven) gave a broad perspective of the problems in semiconductor research. The problems were classified into four main divisions: (i) stationary states, that is, energy band structure of the periodic crystal lattice, including surface and impurity states; (ii) transport phenomena, such as conduction, Hall effect, thermoelectric power; (iii) transition phenomena, which dealt with transitions between stationary states; and (iv) recombination phenomena, which dealt with problems conducted with carrier generation and recombination.

There were some papers that presented theoretical calculations with regard to the structure of energy bands. Among these was the paper of F. Hermann (R.C.A., Princeton, N. J.) on diamond and germanium which gave an interesting insight into the nature of the band structure in this type of lattice. Results, using cyclotron resonance, were reported by A. F.

Kip (University of California), B. Lax *et al.* (Project Lincoln, M.I.T.), and C. Kittel (University of California). Important information was obtained on the energy band structure of germanium and silicon. These results, in conjunction with newly introduced methods, as well as magnetoresistance and infrared absorption measurements, show that, for these two important semiconductors, the electrons, as well as the holes, cannot be characterized by a single effective mass. Investigation of the band structure of alkali chlorides by x-ray spectroscopy was reported by L. G. Parratt (Cornell Uninversity), revealing a narrow $1s$-$3p$ emission in KCl that could not be correlated with the $3p$ valence band. L. Pincherle (R.R.E.) discussed the theoretical determination of electronic band structure of polyatomic crystals.

Various effects associated with surface states were discussed by J. Bardeen (University of Illinois), and results of investigations on germanium, from which the properties of the surface states had been deduced, were presented. Studies of surface properties of germanium by the method of half-cell potential in an electrolyte were reported by W. H. Brattain (Bell Telephone Laboratories). Impurity energy levels in germanium and silicon were discussed by J. A. Burton (Bell Telephone Laboratories).

Transport phenomena—conductivity and galvanomagnetic effects—were the subjects of a number of papers. The effect of nonspherical energy surfaces was considered. Thermal conductivity was also discussed, and evidence of electron contribution to thermal conductivity in InSb at high temperatures was presented by G. Busch (Zürich). Conduction in the impurity bands of a semiconductor was discussed, based upon results of conductivity and Hall effect measurements on germanium at temperatures down to 1°K (H. Fritzsche and K. Lark-Horovitz, Purdue University). Similar results were reported for CdS by F. A. Kröger (Eindhoven). P. Aigrain (Paris University) presented a theoretical attempt to treat impurity band conduction.

Investigations of electron-hole recombination and minority carrier trapping at low temperatures in germanium, emphasizing the effect of localized energy states associated with lattice defects and impurities, were reported by H. Y. Fan (Purdue University). Luminescence and photoconductivity connected with excitation and trapping of carriers were discussed by M. Schoen (Mosbach/Baden) for sulfide-type materials. Observations on the surface recombination of carriers in germanium were presented in several other papers.

The intermetallic semiconducting compounds received considerable attention. H. Welker (Siemens-Schukertwerke, Erlangen) surveyed the properties of a large number of these materials, including combinations of groups II–IV, II–V, III–VI, and V–VI elements, emphasizing III–V compounds. An explanation for the large electron to hole mobility ratio was mentioned, which is based on a one-dimensional Kronig model with alternate deep and shallow potential wells (Seraphin). From a device standpoint, GaAs was reported to make a good high-voltage rectifier up to 250 v with good photosensitivity.

More complicated intermetallic compounds were discussed by C. H. L. Goodman and R. W. Douglas (G. E., Wembley). These compounds included ternary compounds of the formula ABX_2 where A = Cu, Ag; B = Al, Ga, In, Tl; and X = S, Se, Te, and quaternary compounds, such as Cu_2FeSnS_4. Some of these materials gave high back voltage rectifiers of more than 100 v.

There were many contributions to the study of polar semiconductors of the PbS, CdS, ZnS types. Some of these provide excellent examples of the coordination of chemical and physical research. H. J. Vink (Eindhoven) and W. W. Scanlon (U.S. Naval Ordnance Laboratory), on CdS and PbS crystals, respectively, showed how the electric properties of these semiconductors could be controlled at will by heat treatments in the vapor phase of the crystal. A survey of some of the electric and optical properties of the lead compounds was given by R. A. Smith (R.R.E.), in which some of the difficulties of evaluating the energy gap were reviewed.

Silver halides, which possess many properties intermediate between ideal ionic crystals, such as the alkali halides and valence semiconductors, such as Ge and Si, were surveyed by F. Seitz (University of Illinois). The effects of excitons were discussed.

The final paper by D. Polder (Bristol) summarized the results of the conference. An effort was also made to develop a band structure representation of a semiconductor from consideration of different types of bonding and antibonding orbitals.

The proceedings of the conference, including most of the invited and contributed papers, were published in a special issue of *Physica* (Nov. 1954).

H. Y. Fan
Purdue University, Lafayette, Indiana
W. W. Scanlon
U.S. Naval Ordnance Laboratory

Science News

In 1954 the member societies of the **American Institute of Biological Sciences** voted to have the institute become independent of the National Research Council, under which it had functioned since it was formed in 1948. Then last January the institute became incorporated in the District of Columbia as a nonprofit, national organization of professional biological societies and biologists. New office space was secured at 2000 P St. NW, Washington 6, D.C., and in March the staff moved. These offices are on the 5th floor of a newly remodelled building just off Dupont Circle; visitors are cordially invited to see the new quarters.

Hiden T. Cox, professor of botany at Virginia Polytechnic Institute and deputy director of A.I.B.S. for the year 1953–54, has agreed to return on a permanent basis as director of the institute. He will take office on 1 July.

Formation of a **National Health Council Committee on Research Administration** was approved at a meeting of the council's executive committee on 26 Apr. Morton D. Schweitzer, scientific director of the Muscular Dystrophy Associations of America, was named its first chairman. Hugh R. Leavell, president of N.H.C. and head of the department of public health practice of the Harvard School of Public Health, said of the new committee:

> The growing volume of research activities which voluntary agencies carry on makes it imperative that we set up such a Committee. It is particularly important for the voluntary agencies to develop comprehensive facts about what they are doing, now that the Hoover Commission has proposed establishment of a Federal Council of Health to facilitate the health research program of the Federal Government. We should be in a position to collaborate with this Federal Council if or when it is organized.

At a meeting on 11 May, the committee exchanged views on such matters as range of stipends, budgeting, block grants versus project grants, and procedures of reporting to the supporting agency, other health groups, and the public. In addition to Schweitzer, members of the committee are key representatives from 10 national organizations concerned with diabetes, heart, nurses, arthritis and rheumatism, crippled children, infantile paralysis, multiple sclerosis, blindness, tuberculosis, and cerebral palsy.

Children ask more **questions about science** than any other subject, according to a nationwide survey conducted by the University of Illinois. The survey included 6313 pupils in grades 4 through 8, 4531 parents, 212 teachers, and 169 librarians. It was directed by J. Harlan Shores, professor of education. He found questions about science running two to one ahead of questions about other school subjects. At the library, grade-school children are looking up information about science more than information on any other field, and in reading choices, science subjects are among the top three fields. Shores has reported that the survey findings indicate that science needs are not being fully met and that the interest in the subject shown by grade-school pupils is not being fully exploited.

Fence lizards harbor a parasite that has been discovered by Jim Bonorris and Gordon Ball, zoologists at the University of California in Los Angeles. The **newly identified reptilian parasite,** *Schellackia occidentalis,* has an interesting life cycle.

It reproduces in the intestine of the lizard. After going through several stages, it moves into a red blood cell. Then the only way it can get into another lizard is by means of the bite of a bloodsucking animal on the outside of the lizard. Mites which infest the lizard accommodate the organism in this respect, for they suck up blood containing the parasite. Eventually the tongue of another lizard plucks the mite off the back of the first reptile, and the mite-borne parasite is conveyed to its intestinal spawning grounds.

The United States will build a swimming pool **reactor in Geneva,** Switzerland, for demonstration at the United Nations International Conference on the Peaceful Uses of Atomic Energy. The exhibit will enable visiting scientists and technicians to observe a reactor that provides excellent facilities for a variety of cross-section measurements and experiments with neutrons and gamma rays, including shielding studies and production of radioisotopes. Qualified persons will be allowed to operate the machine. The project for the Geneva conference will be carried out by Oak Ridge National Laboratory, which is operated for the AEC by the Carbide and Carbon Chemicals Co.

A 23.2 percent success has been achieved by clinics helping **childless couples** to have children. Among 13,051 couples studied and treated in 21 clinics during a period of 28 years, 3026 pregnancies occurred. These results were reported by Mary Steichen Calderone, medical director of the Planned Parenthood Federation of America, New York, at the recent meeting of the American Academy of General Practice.

In a report published in the May issue of the *Journal of the American Dental Association,* the association's Council on Dental Research recommends that the use of **ultrasonic dental instruments** be withheld until their practicability and safety are proved by extensive investigation. An editorial in the same issue of the *Journal* sharply criticizes the promotion of ultrasonic devices by an equipment manufacturer.

When he delivered the 1955 Arthur Dehon Little memorial lecture at the Massachusetts Institute of Technology last month, Charles A. Thomas of St. Louis, president of Monsanto Chemical Co., urged the removal of the **barriers that separate pure scientists** from applied scientists. In his talk on "Creativity and science," he envisioned a union of theorists and technologists in this country out of which will come the most flourishing, vigorous growth of creativity in all history. He urged that

> From undergraduate training upward—and it cannot be started too early—students of the sciences should be made to appreciate that some men are driven by a deep desire to add to the store of knowledge, that the challenge of discovery is rewarding whether it has immediate practical value or not . . . [that] whatever path the science student chooses . . . he must be conditioned to realize that his choice is made on the basis of personal preference, with the firm conviction that neither the one nor the other is a superior calling.

K. Alvin Merendino, professor of surgery at the University of Washington, Seattle, told the recent American Surgical Association meeting that intestinal sections have been used successfully to replace diseased esophaguses in 10 patients. In the new surgical technique, a part of the **intestine is transplanted** at the junction of the lower esophagus and the stomach as a substitute for the sphincter.

The operation has been used only on patients upon

whom all conventional methods have failed. The studies were supported by Initiative 171 funds and by the U.S. Public Health Service. Merendino was assisted in the research by David H. Dillard, a research fellow at King County Hospital.

Scientific notes, papers, and letters of the late **Enrico Fermi** have been given to the University of Chicago Library by his widow, Laura Fermi. Awards and medals given Prof. Fermi in recognition of his work on the atomic bomb and other scientific achievements, notebooks in which he recorded his theories and experimental data, manuscripts of many of his published papers, and correspondence with important scientists in the United States and Europe are included in the collection.

It is probable that the first **synthetic diamonds** were those produced in February 1953 by the Swedish ASEA electric company in Västerås, which began its work with artificial gems in 1942. The earliest Swedish diamonds were no bigger than grains, but their genuineness was established by means of x-rays and the synthesis experiments have been repeated many times with excellent results.

Scientists in the News

George K. Batchelor of Cambridge University, an authority on turbulence and a pioneer in the new science of magnetohydrodynamics, is spending a 3-mo period, which began 8 May, at Cornell University. A senior lecturer in mathematics at Cambridge, he is taking part in two Government-sponsored research projects in the Cornell College of Engineering: the ionosphere project, sponsored by the Army Signal Corps, and the project on propagation of expansion and compression waves, sponsored by the Office of Naval Research.

K. S. Krishnan, president of the National Academy of Sciences of India, was honored at the annual dinner meeting of the National Academy of Sciences (U.S). Krishnan occupies or has occupied the highest honorary posts in Indian science, including the presidencies of the National Institute of Sciences and the Indian Science Congress Association. His eminence has been recognized in England also, where he was elected a fellow of the Royal Society in 1940 and was knighted in 1946. He is director of the National Physical Laboratory at New Delhi and a member of the Indian Atomic Energy Commission. Krishnan was a special guest of the academy during the 3 days of its recent meeting in Washington.

In addition to presenting a paper on "Thermionic constants determined by a new method" at one of the scientific sessions, he gave a dinner address. In this talk he pointed out that in India science has been most valued as a liberalizing force in culture. Because the development of science is more recent in India than in Western countries, he said that its applications through technology are only now beginning to have significant impact on the life and economy of India. He paid high tribute to the contributions of American science and the sciences of other Western countries to the growth of science in India and to the furtherance of human welfare there. He referred to the value of the wide use of the English language as a means of communicating scientific ideas, and related this to the unique contributions of different cultures to the growth of a common understanding among peoples.

Other speakers at the academy dinner included **Harold Spencer Jones,** Astronomer Royal of Great Britain, and **Charles Greeley Abbot,** former secretary of the Smithsonian Institution, who was celebrating the 40th anniversary of his election to the academy.

Establishment of a scholarship fund in memory of the late **Henry K. Benson,** a member of the University of Washington faculty for 50 years, has been approved by the university board of regents. Dr. Benson, a professor of chemistry and chemical engineering, joined the university in 1904, and headed the department of chemistry and chemical engineering from 1920 until his retirement in 1947. He died last September.

The memorial was created by Mrs. Benson with a gift of $1000, and this sum will be set aside as the core of a fund into which the university will place other contributions from former students and friends of Dr. Benson. Income from the growing fund will be used to aid outstanding students in chemistry and chemical engineering, and it is hoped that the first award may be made for the 1955–56 school year.

Marvin D. Whitehead, formerly of the department of plant pathology, A. and M. College of Texas, became associate professor of field crop pathology in the department of field crops, University of Missouri, on 1 Apr.

Brig. Gen. James P. Cooney has been named to succeed Maj. Gen. Silas B. Hays, the new Surgeon General, as Deputy Surgeon General of the Army. Cooney has achieved distinction as one of the Army's outstanding authorities on radiology and the medical effects of atomic explosions.

The 20th annual **Leo Loeb** lecture, sponsored by Mu chapter of Phi Beta Pi medical fraternity of Washington University School of Medicine, St. Louis, Mo., was delivered on 12 Apr. by **Tinsley R. Harrison,** professor of medicine and head of the department at the Medical College of Alabama. Loeb, in whose honor the annual lecture is given, is professor emeritus of pathology. He is well known for his work on cancer.

Otto Oldenberg, a pioneer in the teaching of atomic physics, will retire this summer as professor of physics at Harvard University. As emeritus professor of physics, Oldenberg will continue experimental research at Harvard, research that is supported by the Office of Naval Research and the Air Force Cambridge Research Center. Oldenberg's advanced labora-

tory course in atomic physics, which was initiated at Harvard in 1931, was one of the first such courses to be given at an American or European university. He is the author of a standard college textbook, *Introduction to Atomic Physics,* the second edition of which was published in 1954.

His major research has been concerned with the kinetics of chemical reactions in gases. He used the absorption spectrum as a test for free radicals—particles that by their chemical instability rapidly disappear. Later his interest turned to fundamental processes in gases, for he wished to explain phenomena in the upper atmosphere such as the aurora and the weak radiation emitted from the upper atmosphere of the earth that is observed as the light of the night sky.

Oldenberg was born in Berlin, Germany, in 1888. He received his undergraduate education at the universities of Heidelberg, Göttingen, and Munich; the Ph.D. at the University of Göttingen in 1913, and the M.A. from Harvard University in 1942. For many years he was associated with the University of Göttingen. He joined the Harvard staff as a lecturer in 1929 and was appointed professor of physics in 1930.

The memory of the late **Brig. Gen. James Stevens Simmons,** MC, USA (Ret.), was honored on 21 Apr. by a memorial lecture delivered at Walter Reed Army Medical Center by **John H. Dingle,** professor of preventive medicine at Western Reserve University School of Medicine. In the future the lecture will be known as the James Stevens Simmons Memorial Lecture; it is to be given annually on a subject pertaining to preventive medicine. Simmons retired in 1946 after 30 years of service in the Army Medical Corps. At the time of his death on 31 July 1954 he was dean and professor at the Harvard School of Public Health.

Loren C. Petry, professor of botany at Cornell University for more than 30 years, will retire on 30 June. He is a faculty member of both the College of Agriculture and the College of Arts and Sciences; and for 10 years, beginning in 1934, he directed Cornell's Summer Session, reorganizing and coordinating what originally were four separate units. During World War II he guided the basic course of the Army Specialized Training Program at Cornell, and in June 1944, he resigned his summer-session post to become director of veterans' education. At the program's beginning, there were only about a dozen veterans attending Cornell under G.I. benefits, but by the fall of 1947 there were 5200, and when he resigned in 1948 to give full time to teaching and research there were 4800.

In 1952 Petry received the "Outstanding Professor" award from the senior class of the College of Agriculture. His enthusiastic students maintain that he leaves them with "a lasting understanding of the basic how's and why's of the plant world." Believing in teaching ways of learning instead of subject matter alone, Petry changed his botany instruction in 1938 to emphasize laboratory work over lectures. With E. M. Palmquist, then at Cornell, he published a laboratory manual embodying this method. During the 1955–56 academic year, after a 6-wk vacation abroad, he will go to the University of Missouri to assume the teaching post of Dr. Palmquist, who will be on leave.

Petry, whose research has been in paleobotany, leaves Cornell one of the best collections of Devonian plants in America. It was as a result of his enthusiasm that paleobotany was introduced at Cornell in 1925 as a subject for graduate study. Petry's nonprofessional interests are mountain climbing, sailing, and gliding.

As a youth Petry did not plan to study botany. In 1907 he received a B.S. in civil engineering and mathematics from Earlham College, and in 1908 a B.S. from Haverford College, where he is now a member of the corporation. Returning to Ohio, the state where he was born in 1887, he taught science in the Urbana high school for 2 years; this stimulated his interest in botany. In 1911 he received his M.S. in botany from the University of Chicago, and in 1913 his Ph.D. He became an instructor at Syracuse University in 1914, and left his position there to go to Cornell.

Cecil E. Boord, research professor emeritus of the department of chemistry at Ohio State University, will receive the university's Joseph Sullivant medal on 10 June. This award, which is presented only once every 5 years, is given in recognition of an "admittedly notable achievement" in the arts or sciences by an alumnus, a former student, or a faculty member of the university. Boord is being honored for his long years of pioneering research in the synthesis and testing of the hydrocarbon components of gasoline.

Last month Pope Pius XII announced 14 appointments to the **Pontifical Academy of Science,** which raised the number of academicians to 66: Theodore von Kármán, director of the Guggenheim Aeronautical Laboratory of California Institute of Technology; Charles Herbert Best, professor of physiology at the University of Toronto; Paul Niehans, Swiss gerontologist, member of the senate of the University of Tübingen, and the Pontifical physician; Hermann Alexander Drueck, director of the Dublin Astronomical Observatory; Louis de Broglie, professor of theoretical physics at the University of Paris, perpetual secretary of the Academy of Science of the Institute of France, and Nobel prize winner; Julio Cesar Garcia Otero, professor of medical pathology at the University of Montevideo; Otto Hahn, president of the Max Planck Institute and Nobel prize winner in chemistry; Werner Carl Heisenberg, professor of theoretical physics at the University of Göttingen and Nobel prize winner; Walter Rudolph Hess, professor of physiology at the University of Zurich and Nobel prize winner in medicine; Gaston Maurice Julia, professor of mathematics at the Sorbonne and the Polytechnic Institute of Paris; Arne Tiselius, professor of biochemistry and director of the Bio-

chemical Institute at the University of Uppsala; Artturi Ilmari Virtanen, professor of chemistry at the University of Helsinki, president of the Academy of Finland and Nobel prize winner in chemistry; Max von Laue, professor of physics at the University of Göttingen and Nobel prize winner; and Hermann Weyl, professor of analysis and higher mechanics at the University of Zurich.

Edward M. Weyer, Jr., editor of *Natural History,* received the annual award of the National Life Conservation Society during a recent meeting at the American Museum of Natural History, New York. He received a scroll citing his 20-year tenure as editor of the magazine.

A. G. Norman, who has been on the University of Michigan faculty as a research botanist for the Michigan Memorial Phoenix Project No. 32, and as a professor of botany, without tenure, in the College of Literature, Science and the Arts, has been appointed director of the Botanical Gardens and professor of botany, with tenure. He will succeed **H. H. Bartlett** when the latter retires on 1 July.

Howard A. Rusk, professor and chairman, and **Eugene J. Taylor,** assistant professor, department of physical medicine and rehabilitation, New York University College of Medicine, were recently awarded the Order of Merit José Fernandez Madrid by the Government of Colombia. This is the highest health award given by the armed forces of Colombia and was bestowed for "distinguished service for the military health of Colombia." Rusk and Taylor, with Captain Thomas Canty, U.S. Navy Hospital, Oakland, Calif., recently visited Colombia, where they conducted clinics, lectures, and demonstrations, and acted as consultants for the new 850-bed military hospital being erected in Bogotá.

Leslie G. Smith, English geophysicist with the U.S. Air Force Cambridge Research Center, has been awarded the 1954 Darton prize by the Royal Meteorological Society of London for his paper, "An electric field meter of extended frequency range," which was published recently in the *Review of Scientific Instruments.* The article describes a meter developed by Smith to measure the recovery of field strength under a thundercloud after the occurrence of a lightning stroke. Recovery times are measured in fractions of a second, and no field meter was previously available which would measure in the order of a thousandth of a second.

This summer Smith will return to Florida, where he first conducted his thunderstorm electricity experiments. He will establish a ground network of field meters in the vicinity of Orlando, utilizing a large area to intercept as many thunderstorms passing over the region as possible. He will be joined by **Christos Stergis,** another thunderstorm specialist, who will fly large constant-level balloons above the thunderstorms to measure the field strength and charge density on top of thunderclouds. Data measured by the balloon equipment will be transmitted to the ground by means of a radio link.

Smith and Stergis are part of a small team of scientists from the Air Force Cambridge Research Center who are conducting intensive studies of thunderstorms and lightning in the interest of the operational safety of modern military aircraft.

Levie van Dam has been appointed associate curator of ichthyology by the Academy of Natural Sciences of Philadelphia. He will make preliminary studies for the new aquarium to be built by the Fairmount Park Commission. These studies will enable the academy to perform the needed advisory service while the new aquarium is being planned, built, stocked, and added to the educational facilities and public buildings at Fairmount Park. At present Van Dam is conducting fish research at the Oceanographic Institution, Woods Hole, Mass.

The following appointments to assistant professor have been announced. Catholic University: **Gottfried O. Lang,** anthropology. University of Utah: **Russell M. Nelson,** surgery.

Meetings

The 1955 **Conference on Nuclear Chemistry** of the AAAS Gordon Research Conferences will take place in Meriden, N.H., 27 June–1 July. Chairman and vice chairman are Anthony Turkevich of the University of Chicago and Leo Yaffe of McGill University. For further information on the Gordon Conferences, see *Science* **121**, 571 (22 Apr. 1955).

27 June, Theoretical aspects of nuclear chemistry, A. Turkevich, *discussion leader*: P. Morrison, "Nuclear models"; G. Breit, "Remarks on the theory of nuclear reactions induced by heavy ions"; J. D. Jackson, "A schematic model for (p, xn) and spallation reactions in heavy elements." *Nuclear reactions at energies below 100 Mev,* G. Friedlander, *discussion leader*: J. W. Cobble, "Fission-spallation competition at low energies"; R. M. Diamond, "Production of isomers and excitation functions below 100 Mev."

28 June, Nuclear reactions induced by heavy ions, G. Breit, *discussion leader*: W. Forsling (title to be announced); K. Chackett (title to be announced); H. L. Reynolds, "Excitation functions for nitrogen induced reactions"; a representative of the University of California, "Heavy ion bombardment work and plans at Berkeley"; G. Breit, "Yale plans for a heavy ion accelerator." *Nuclear reactions in the Bev region,* N. Sugarman, *discussion leader*: K. Chackett, "Spallation products formed in light elements with protons of energy up to 0.95 Bev"; G. Friedlander, "Radiochemical studies at the cosmotron"; E. Hyde, "Radiochemical studies at the bevatron."

29 June, Nuclear fission I, L. Yaffe, *discussion leader*: G. T. Seaborg, "Spontaneous fission"; E. P. Steinberg, "Fission yields and fine structure by mass spectrometry"; R. H. Tomlinson, "Thermal neutron fission yields in U^{235}"; S. Thulin, "Rare gas fission products"; D. O'Kelley, "Short-lived fission products." *Nuclear fission II,* L. Glendenin, *discussion leader*: J. S. Gilmore, "Fission studies at Los Alamos"; B. L. Cohen, "Angular distribution of fission fragments"; R. L. Wolke, "Angular distribution

of fission fragments from the high energy proton bombardment of bismuth"; R. A. Schmitt, "Fission asymmetry as a function of excitation"; L. Katz, "Photo-fission studies."

30 June, Neutrino experiments: F. Reines and C. Cowan, "Status of Los Alamos neutrino experiment"; R. Davis, "Status of Brookhaven neutrino experiment"; J. M. Robson, "Angular correlation in neutron decay." *Positronium*, M. Deutsch, *discussion leader*: M. Deutsch (title to be announced); R. E. Bell (title to be announced).

1 July, Radiochemical separations, E. Hyde, *discussion leader*: K. Kraus, "Anion exchange column separations"; R. Prestwood, "Radiochemical separation methods at Los Alamos"; B. G. Harvey, "Ion exchange separation methods applied to heavy elements."

The 7th **International Congress of Comparative Pathology** will be held at the Institut d'Anatomie Pathologique, Lausanne, Switzerland, 26–31 May. The program will include, in part, formal papers and discussions on viral infections transmitted to man by animals; pathologic and hygienic aspects of atmospheric pollution problems; and growth disturbances in comparative pathology, including the human problem. Requests for the program and inquiries concerning registration should be addressed to the Chairman of the U.S. Section, Lee M. Hutchins, Chief, Division of Forest Disease Research, U.S. Forest Service, Washington 25, D.C.

The 2nd **International Powder Metallurgical Congress** will take place in Reutte, Tyrol, Austria, 20–23 June. Its sponsor, Paul Schwarzkopf, president of American Electro Metal Corp., Yonkers, N.Y., and owner of the Metallwerk Plansee in Reutte, has announced that the topic will be "High temperature and corrosion-resistant materials by powder metallurgy." Approximately 300 representatives from 17 nations have been registered as delegates, and among them are 36 U.S. scientists, industrialists, and engineers.

A conference on **Nutrition in Infections** will be held at the Barbizon-Plaza Hotel, New York, under the auspices of the New York Academy of Sciences, 24–25 May. Some 17 U.S. participants and Joachim Kühnau of the University of Hamburg, Germany, and Ruben Lopez-Toca of the University of Havana Medical School, Cuba, will deliver papers covering the role of nutrition in the prophylaxis and treatment of disease, experimental deficiencies, effects of vitamins and antibiotics, and so forth.

W. A. Wright, medical director of the Pfizer Laboratories division of Chas. Pfizer and Co., New York, is conference chairman, and session chairmen are Norman H. Jolliffe, director of the bureau of nutrition, Department of Health, New York City, and Henry Welch, director of the Division of Antibiotics, U.S. Food and Drug Administration, Washington, D.C. An understanding of the exact role of nutrition in the maintenance of health and in the prevention and treatment of disease, and the voluminous data concerning the interrelations between antibiotics and nutrition in various infections, are important data to be dealt with during this conference.

At the annual Washington (D.C.) meeting of the **American Physical Society** 28–30 Apr., a large attendance heard 394 contributed papers and 27 invited papers. Four sessions dealt with new results in meson physics. The discovery that heavy kappa mesons can be produced by the bevatron and the cosmotron makes possible a detailed study of these particles comparable with recent research on pi and mu mesons. This may reduce the confusing complexity of heavy-meson phenomena.

In an invited paper on the new transuranium elements, A. Gihorso announced the discovery of element 101, named mendelevium by him and the other members of Seaborg's staff at the University of California. This isotope of mass 256 was formed by bombarding element 99 with alpha particles. Seventeen atoms of 101 decayed with a half-life of the order of 1 hr. With increasing atomic weight, the half-life for fission decreases much more rapidly than that for alpha emission, and for element 101 the two are of the same magnitude.

A symposium honoring the memory of Enrico Fermi was an impressive event that drew a capacity audience. H. A. Bethe was chairman, and F. Seitz, E. Konopinski, E. Segrè, W. H. Zinn, and H. L. Anderson discussed five fields in which Fermi made outstanding contributions: Fermi statistics, beta decay, neutron physics, atomic energy, and mesons.

A **Health Physics Conference,** devoted to radiation safety, will be held 13–15 June at Ohio State University. Topics on the program include radioactive waste disposal, air sampling, dosimetry, health physics instrumentation, legislation, reactor safeguards, and other specialized subjects. The meeting is intended to bridge a gap between the theory of radiation safety and its practice in the field in the last few years. Information may be obtained from Francis J. Bradley, Office of Radiation Safety, Ohio State University, Columbus 10.

A **Symposium on the Chemistry of Natural Products** will take place at the Israel Institute of Technology, Haifa, 28–29 June. Participants from the United States and the United Kingdom will be D. H. R. Barton, University of London; C. Djerassi, Wayne University; S. M. Kupchan, Harvard University; R. A. Raphael, Queen's University of Belfast; and G. Stork, Columbia University.

The 28th annual scientific session of the **American Heart Association** will be held on 22–24 Oct. at the Jung Hotel, New Orleans, La. Meetings sponsored by the Council on Community Service and Education and the Council on Rheumatic Fever and Congenital Heart Disease will be held 23–24 Oct. The assembly panels will follow the scientific sessions on 25 Oct. and the general assembly will take place on the morning of 26 Oct.

Those who wish to present a paper should submit an abstract, not exceeding 300 words, in duplicate, to the Medical Director, American Heart Association, 44 E. 23rd St., New York 10, *not later than 1 July.*

Education

A special **workshop in the teaching of astronomy** is being offered in the Cornell University Summer Session by R. William Shaw of the department of astronomy. The course will include an analysis of astronomy in science education with a view to strengthening its effectiveness as a preparation for the appreciation and solution of intellectual and practical problems arising from man's conquest of space. The material will be of special interest to teachers of secondary-school science, to college teachers of introductory astronomy, and to civic group leaders. Objectives are (i) a consideration of curriculum content for high-school, college, and civic groups; (ii) a review of subject matter with emphasis on teaching techniques; (iii) a study of methods and materials for demonstrations, model construction, group projects, celestial observation, and sources of supply. In addition, a limited number of students may construct, under supervision in the department's optical shop, the optical elements for their own reflecting telescopes. Inquiries may be addressed to Prof. R. William Shaw, Department of Astronomy, Cornell University, Ithaca, N.Y.

Michigan State College in East Lansing has been redesignated as **Michigan State University** by the State Legislature. However, the University of Michigan at Ann Arbor may challenge the constitutionality of the change.

More than $7 million has been donated for the **Albert Einstein College of Medicine** of Yeshiva University according to an announcement by the society of the founders of the college. The society is composed of 137 persons who have contributed $25,000 or more to the $10-million building program. The school, nearing completion at Eastchester Rd. and Morris Park Ave. in the Bronx, New York, will admit its first class next September.

Graduate medical training grants of $126,000 have been awarded to the **University of Pennsylvania Graduate School of Medicine** for a 2-year period by the National Institute of Neurological Diseases and Blindness to initiate a unique program of training teachers and investigators in neurology and ophthalmology. Julius H. Comroe, Jr., professor of physiology and pharmacology, will be the program director.

The new course, to begin in the fall of 1955, will be the first of its kind in this country. It will be designed for neurologists and ophthalmologists who have decided to enter or continue a full-time academic career in teaching and research in these specialties. Prospective candidates either must be certified by the American Board of Neurology or the American Board of Ophthalmology or must have all or most of the requirements for Board certification. Preference will be given to men who have been selected by their own medical school faculties for advanced training, with the understanding that after the academic year at Pennsylvania they will return to their own departments to do full-time teaching and investigative work as a career.

Probably not more than five neurologists and five ophthalmologists will be accepted during the first year; it is hoped that the majority of these will be able to obtain partial fellowship support during the training period. One or two internists or surgeons may be accepted during the first year in order to determine the effectiveness of the new program in training medical teachers and investigators in general.

An important part of this new course will be instruction in the art and technique of teaching. This will be accomplished largely by practical work. Initially, the group technique will be utilized in which each member of a small group is in turn the lecturer while the remainder of the group serves as a critical audience. Each lecture will be recorded so that the lecturer will have the benefit of both the playback and audience reaction [see *J. Medical Education* **29**, 39 (1954)]. Recordings will be kept and compared with later performances, in order to gage progress. Later, the "students" will be given active teaching responsibilities, under supervision. Since teaching involves more than lecturing to large groups, there will also be considerable practice in conference, seminar, and ward-round types of instruction. No attempt will be made to achieve uniformity in teaching; the emphasis will be upon improvement in those techniques best suited to the personal attributes of each physician. In addition, attention will be paid to the use of visual aids, the proper design of examinations, and appropriate faculty-student relationships. Special seminars on medical writing and library utilization will be given. The men will also be given broad training in the basic medical sciences of physiology, pharmacology, biochemistry, anatomy, pathology, and microbiology, with particular emphasis on their relation to clinical problems.

Another feature of the course will be a training program designed to provide a good scientific background for medical research. The faculty realizes that it cannot create investigators by didactic courses; however, it believes that it can provide an opportunity for advanced learning that would be very difficult to obtain through existing means. Among the new courses to be created especially for this group are (i) mathematics for physicians engaged in medical research; (ii) statistics and the design of experiments; (iii) recent advances in electronics, chemistry, and physics; (iv) techniques of investigation and their critical analysis; (v) seminars on critical evaluation of medical literature; and (vi) philosophy of research.

Since many of the trainees may eventually become departmental chairmen, special seminars will also be offered on medical administration (including budgeting, personnel selection, hospital administration, and voluntary health plans).

The courses will be given by outstanding teachers, clinicians, scientists, editors, and educators, many of whom will be from universities outside the Philadelphia area. Although it is anticipated that stu-

dents in this course will already be well qualified clinically, courses in the present program of the Graduate School of Medicine may be taken by the group as elective courses. In addition, an opportunity will be offered for investigative work. The course work, coupled with research, will be acceptable as credit for the degree of doctor of science (med.). Address inquiries to Dr. J. H. Comroe, Jr., Graduate School of Medicine, University of Pennsylvania, Philadelphia 4, Pa.

Grants, Fellowships, and Awards

The **Monsanto Chemical Co.** has announced an expanded program of financial **aid to scientific education** during 1955–56. A total of 53 American colleges and universities will benefit from 72 awards, an increase of 9 in the number of schools aided and an increase of 15 in the number of awards granted. The allocations for the coming year include 16 fellowships, 31 undergraduate scholarships, and 25 cash grants that may be used at the schools' discretion to finance research, purchase equipment, or further any other scientific purpose.

These awards are but one phase of Monsanto's overall program of cooperation with scientific education. The company's operating divisions supplement the corporate program with numerous grants for specific research, through faculty and student trainee programs, and by the donation of equipment and materials to schools. The company also makes grants to educational projects of the National Science Teachers Association, the American Institute of Chemical Engineers, and the American Chemical Society.

The City of New York has established **Jonas E. Salk scholarships** of $3500 each to be awarded annually to two outstanding seniors in each of its four colleges. The grants will be for postgraduate study in medical science.

The National Research Council of Canada has granted 267 scholarships for 1955–56, with a total value of $336,300. These scholarships include 62 bursaries worth $800 each, 133 studentships worth $1100 each, and 18 fellowships worth $1400 each. All of these are to be held in Canada.

Special scholarships awarded for study abroad include 33 awards worth $1900 each. These special scholarships are to be held in the following countries: 11 in the United States, 19 in the United Kingdom, 1 in France, 1 in Sweden, and 1 in Denmark.

Twenty-one overseas postdoctorate fellowships at $2500 each have been granted for work in the following countries: 15 in the United Kingdom, 1 in Sweden, 1 in Denmark, 1 in France, 2 in the Netherlands, and 1 in Belgium.

A $45,000 grant has been received from the **Wieboldt Foundation** of Chicago by Northwestern University's school of speech for the establishment of an institute for language disorders in children. Helmer R. Myklebust, Northwestern professor of audiology, has been named director of the new institute. Since 1950 he has been director of the children's hearing and aphasia clinic, of which the institute is an outgrowth. The institute will study language disorders resulting from deafness, brain injury, and emotional disturbances. Primary emphasis will be given to children more than 2 years old who have not yet completed their early school years.

The **Link Foundation,** a trust founded to advance training and education in aeronautics, has recently awarded grants to Ohio State University and to Tufts College, for the establishment of two fellowships in, respectively, aviation medicine and aviation psychology.

Miscellaneous

A traveling **exhibit of medical art** entitled "Ars Medica," comprising works by Rembrandt, Daumier, Hogarth, Toulouse-Lautrec, and others, is being displayed at medical schools and hospitals throughout the country. Until 27 May it will be on view at the Georgetown University Medical School in Washington, D.C.

Owned by the Philadelphia Museum of Art, the exhibition is being presented by Smith, Kline and French Laboratories. The scope of the show, which is thought to be the first collection of its kind, extends from medical illustrations designed for teaching purposes—such as those of Vesalius, Wechtlin, and others—to portrayals and critiques of medical procedures in the past.

A new table-of-contents service, ***Current Articles Unlimited,*** has been announced by the Spartan Co. This weekly publication will cover the contents listings of approximately 400 medical-science-technology journals. One copy of the entire coverage can be ordered for $75 annually, or a particular subject group can be subscribed to separately for $25. Multiple copies are offered at a great reduction in price and may be used for library circulation. For information write to the Spartan Co., 18 E. 17 St., New York 3, N.Y.

A copy of ***Amino Acid Biogenesis and Protein Synthesis,*** the proceedings of the symposium held recently at UCLA, may be obtained by sending $2 to M. S. Dunn, Chemistry Department, University of California, Los Angeles 24, Calif. Participants were Sidney Weinhouse, Bernard D. Davis, Philip P. Cohen, Alton Meister, Charles S. Hanes, and Halvor N. Christensen.

The **Federation of American Scientists** moved on 7 May from 1749 L St., NW, to new quarters at 1805 H St., NW, Washington 6, D.C.

Erratum: In the issue of 14 Jan., page 58, J. J. Thomson was incorrectly referred to as Lord Kelvin. As one of our readers has pointed out, J. J. Thomson was indeed eminent, but he was not Lord Kelvin.