said at the beginning of the Survey's 51st year, "The one hundredth report of the Director of the United States Geological Survey may be expected to be simply a report of progress."

It seems appropriate to close this episodic history of the Geological Survey with the words of a dedication by Emmanuel de Margerie, which appeared in his *Etudes Americaines, Geologie et Geographie* (Librairie Armand Colin, Paris, 1952).

A LA GLOIRE DES MEMBRES DE
L'UNITED STATES GEOLOGICAL SURVEY
dont la féconde activité, au cours du dernier
siècle, a révélé,
dans l'Ouest du Territoire
tant de faits nouveaux et importants pour la Science

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News and Notes

Fourth Rochester High-Energy Physics Conference

The fourth in the annual series of conferences on high-energy nuclear physics initiated by R. E. Marshak, chairman of the Rochester physics department, and sponsored jointly by a group of local industries and the National Science Foundation, was held on Jan. 25–27. The conference chairman this year was J. B. Platt. About 75 representatives of American and European laboratories actively engaged in high-energy physics and cosmic-ray research attended the sessions. Attention was focused on the fundamental experimental and theoretical problems of nucleon-nucleon, meson-nucleon, and photon-nucleon interactions and the various unstable particles found in the cosmic radiation and now also produced artificially by the Brookhaven cosmotron.

J. R. Oppenheimer (Institute for Advanced Study) presided over the opening session on nucleon-nucleon scattering, polarization, and π-meson production. Ashkin (Carnegie Tech) reported on the differential p-p scattering cross section at 437 Mev measured by Sutton and Fox which shows a rise at small angles, in disagreement with results at Chicago; the discrepancy seems to arise from different methods of correcting for the process $p + p \rightarrow \pi^+ + d$. The n-p differential cross section at 400 Mev measured by Hartzler and Siegel at Carnegie Tech (reported by de Benedetti) shows the same asymmetry about 90° found at lower energies. Pickavance (Harwell) reported that R. Wilson's n-p measurement at 102 Mev confirmed the older symmetric results at 90 Mev, but by 133 Mev, this symmetry is disappearing.

Oxley (Rochester) summarized the original experiments showing strong polarization in 230-Mev proton scattering in hydrogen and several other elements. These are now confirmed at 150 Mev (Dickson and Salter, Harwell), 337 Mev (J. and L. Marshall, Chicago), 330 Mev (Chamberlain and Segrè, Berkeley).

The later experiments also give the angular distribution of the polarization and are in agreement. What is not yet clear is the relative importance of elastic, quasi-nucleon, and inelastic contributions to the polarized scattering from complex nuclei. In striking contrast, the polarization in p-n-p scattering at 340 Mev (Bradner, Berkeley) and 240 Mev (Hafner, Roberts, and Tinlot, Rochester) is only about 5 to 10 percent. Breit (Yale) noted that while the unpolarized nucleon-nucleon data could be fitted by S and P phase shifts alone, the angular distribution of the polarization as analyzed by L. Marshall requires the presence of at least F waves as well. The hard core singlet potential model explains the p-p angular distribution but has too weak noncentral forces to fit the polarization, whereas the singular tensor force model, which fails for the angular distribution, gives the right order of magnitude of polarization. Carnegie Tech results on $p+p \rightarrow \pi^+ + d$ at 437 Mev extrapolate to give agreement with earlier measurements at Columbia of the inverse process. Moyer (Berkeley) reported recent results on $p+d \rightarrow He^3+\pi^0$ that are compatible with the charge independence requirement that they be one-half of the corresponding area section for the process $p+d \rightarrow H^3+\pi^+$, but do not yet prove that it holds. Thorndike (Brookhaven) reported that for 1 to 2.2 Bev n-p collisions, two π mesons are produced much more often than one, whereas the statistical theory of production would predict the reverse situation. Brueckner (Indiana) showed that interactions between the nucleons in the final state could possibly account for the discrepancy.

W. K. H. Panofsky (Stanford) chaired the experimental session Monday afternoon. Rainwater (Columbia) reported on extensive work on the Z dependence and fine-structure splitting of K x-rays from μ-mesic atoms, which is giving information about charge distribution in heavy nuclei comparable to that obtained from high-energy electron scattering. De Benedetti (Carnegie Tech) has measured both K and L x-rays in low Z π-mesic atoms and finds a puzzling depression of the L radiation at low Z. Platt and Camac (Rochester) agree with the x-ray results for $Z > 6$ but think that discrepancies at lower Z may be due to neglect of the correction for escape of quanta from the detecting crystal. Lederman (Columbia) has measured the μ decay spectrum giving $\rho = 0.64 \pm 0.09$ ($m_\mu = 207.0\ m_e$). He has also looked at internal conversion gamma rays from π^- mesons stopping in hydrogen arising from the two processes $\pi^- + p \rightarrow n + \pi^0$ and $\pi^- + p \rightarrow n + \gamma$ and obtains results in agreement with theory. Stinberger (Columbia) is making a direct measurement of $\pi^- + d \rightarrow 2n$. Moyer (Berkeley) had a proposed method for a direct measurement of the π^0 lifetime. R. Walker (Cal Tech) and Bernardini (Illinois) discussed the calibration of bremsstrahlung from electron synchrotrons. Strauch (Harvard) showed that 97-Mev protons on complex nuclei undergo inelastic processes which exhibit a definite level structure.

The separate theoretical session was presided over by G. Wentzel (Chicago). Goldberger (Chicago) attempted to show that the currently fashionable PS-(PS) meson theory is in disagreement with experiment. His procedure is to calculate *rigorously* (in the limit of vanishing external meson mass) the cross section for meson-nucleon scattering at zero energy and, thus, evaluate the coupling constant. This coupling constant being small, he then evaluates the photomeson production cross section at threshold by perturbation theory and cannot reproduce the experimental results. Unfortunately, experimental results presented at this conference indicate that the former process is probably larger than had been thought and, therefore, prevents strict conclusions being drawn. Källén (Institute) objected on theoretical grounds that if any process (such as photomeson production in this case) leads to a large coupling constant, no perturbation expansions are valid even if another method of determining the coupling constant leads to a small value. Lévy (Paris) presented an attack on the problem of removing divergences that arise from iteration of the meson-nucleon scattering equations. Wick (Carnegie) outlined a promising approach to the relativistic two-body bound-state problem. Klein (Harvard) and Feldman (Rochester) pointed out certain errors that have been made in the application of the Tamm-Dancoff method. Feldman particularly stressed that in most calculations so far carried out on the nuclear-force problem, this method is no improvement on weak-coupling perturbation theory. Brueckner (Indiana) indicated that the PS(PV) potential with core that fits the two nucleon data can possibly also lead to the saturation of nuclear forces.

At the Tuesday morning session, the chairman, C. D. Anderson (Cal Tech) summarized the results of the Duke conference on the present status of hyperons (Λ^0, Λ^+, Ω^-) and K-particles (τ^+, θ^0, κ, χ). Leprince-Ringuet (Paris) presented evidence for a new particle of mass about 913 m_e which decays to a μ meson of apparently unique momentum 220 ± 3 Mev/c, and a single light neutral particle. Kaplon (Rochester), Reynolds (Princeton), Klarmann (Rochester) Goldhaber (Brookhaven), and Crussard (Rochester) presented cases of K-particle decay and interaction, of artificially produced particles in the last two instances. Hyperon and θ^0 decays were presented by Thompson (Indiana), Fowler (Bristol), Thorndike (Brookhaven), and Anderson. Fowler also has evidence for the production in high-energy events of particles of mass around 1400 m_e which seem distinct from most observed K-particles. Crussard has an event that is interpretable as a hyperon replacing a nucleon in an α-particle, and Primakoff (Washington, St. Louis) discussed calculations of the branching ratios for decay of such hyperon-nucleon combinations. Dalitz' (Cornell) analysis of momentum distribution in τ decays may soon eliminate the possibility of an alternative two-π decay mode for this particle as more data become available. Wheeler (Princeton) presented calculations undertaken to assess the possibility that a single particle of mass about 960 m_e could explain the existing data as alternative decay modes.

E. Fermi (Chicago) presided over the Tuesday afternoon session on pion problems, which was continued Wednesday morning under the chairmanship of H. A. Bethe (Cornell). Total cross sections for $\pi^- + p$ interaction from 133 to 258 Mev and $\pi^+ + p$ from 128 to 182 Mev were reported by Ashkin (Carnegie); they exhibit a strong maximum around 200 Mev, and the fact that σ^+ is very closely $3\sigma^-$ favors the interpretation of this as a resonance in the state of isotopic spin 3/2. Brookhaven experiments have extended our knowledge of these two cross sections to 1.5 Bev, as reported by Yuan and Piccioni. The most interesting feature is a maximum in σ^- around 1 Bev of about twice the value found for σ^+; this is very suggestive of a strong interaction in the state of isotopic spin ½ at this energy. Thorndike (Brookhaven) has cloud-chamber results indicating that perhaps 2/3 of σ^- is inelastic at high energy. W. D. Walker (Rochester) at the same energy finds perhaps an even larger proportion of inelastic events and an interesting tendency for rather small momentum transfers in the collisions. Yuan (Brookhaven) has preliminary results on the energy spectrum of πs produced from Be as a function of the incident proton energy. Roberts (Rochester) has obtained an angular distribution of the 40-Mev π^- charge exchange scattering in hydrogen which, together with Barnes' previous results on charged meson scattering, allows a determination of the phase shifts. Coulomb interference at this energy allows in principle a determination of the absolute signs of the phase shifts, but present inaccuracies allow an alternative set to that preferred by the theorists. Bernardini (Illinois) has pushed the determination of the photoproduction cross section for π^+ from hydrogen close to threshold, and his results show that the energy variation of the pion-nucleon-scattering phase shifts below 40 Mev cannot be linear. R. Walker (Cal Tech) reported two independent experiments on the angular distribution of this cross section from 250 to 500 Mev and also for neutral meson photoproduction at two angles over the same energy range.

Bethe (Cornell) discussed the phase-shift data on pion-nucleon scattering now available, showing that a set acceptable to the theorists could be found, and suggesting experiments to distinguish it from other sets. He reconciles the low-energy photomeson and scattering data by an extrapolation procedure that is qualitatively similar to the predictions made by an S-wave potential model presented by Noyes (Rochester). Very tentative results at 5 Mev support this idea, but equally uncertain results on D waves at 217 Mev would tend to invalidate the high-energy analysis. Rarita (Brooklyn College) discussed the data in terms of a one-level resonance formula. Sachs (Wisconsin) presented a phenomenological model for the meson-nucleon system that seems to possess the right qualitative features to give the "observed" phase shifts. Chew (Illinois) showed that his weak-coupling, extended source model, which fits the p-wave scattering, may also prove capable of explaining photomeson production correctly.

A comprehensive report on this conference, prepared by H. P. Noyes, E. M. Hafner, J. Klarmann, and A. E. Woodruff, is available through the department of physics, University of Rochester.

H. P. Noyes

University of Rochester
Rochester, New York

Science News

In the face of a serious decline in the number of graduate students in science, **the draft** is now putting specialists into the army immediately upon their receiving undergraduate degrees. This situation, highly dangerous to the future supply of scientists and engineers, is discussed by Howard A. Meyerhoff, executive secretary of the Scientific Manpower Commission, Washington, D.C., in the June issue of *The American Psychologist,* which is published by the American Psychological Association.

The draft will come to mean that every able-bodied male of military age who is not in service or in the ministry will be selected for service, Dr. Meyerhoff warns. Since May 1, 1953, local draft boards have been taking graduation from college as their clue to reclassify recipients of the bachelor's degree. Graduates lose their deferment, even though they may go on to graduate work with scholarships and fellowships in many cases actually awarded by the government itself. First-year graduate enrollment dropped to 8000 in the academic year 1952–53, whereas it was 11,721 in 1951–52. The mortality during the summer months was especially severe, and many departments found themselves without graduate assistants when classes started in September.

National Science Foundation fellows and Office of Naval Research and Atomic Energy Commission research assistants were prominent among the casualties, as revealed by a sample survey of 34 departments in 19 institutions. This spot check, which was made in October, indicated that more than 2000 advanced graduate students had been inducted without regard to the status of their work.

The disregard of the best and most disinterested educational judgment and advice can be substantiated by innumerable specific cases, Dr. Meyerhoff declares. Selective Service has virtually taken over our system of graduate instruction in science, he charges. It has drastically cut the number of students, and is thus disrupting the supply and the flow of carefully selected manpower into fields where there are already disturbing shortages. It is seriously impairing the effectiveness and the pattern of instruction at the undergraduate, as well as the graduate level. It is pursuing a course that runs counter to the advice of the scientists from whom it sought advice, and counter to the national welfare as the Department of Labor sees it. It is depriving the Armed Forces of people with highly specialized training, insofar as there is a need for such men in uniform. It is, however, a real benefactor to foreign students, who, of dire necessity are being hired, according to Roger Adams of the University of

Illinois, to fill 50 to 75 percent and more of the vacant graduate assistantships.

The completion of **The American Museum of Natural History's Hall of North American Mammals** was marked by a combination preview and dedication ceremony on May 18. The Hall was conceived more than 20 yr ago to serve as an enduring representation of the mammals of this continent and as a demonstration of the importance of conserving our natural resources. However, it is not only a display of animals and scenic grandeur, but is also a hall of North American ecology, with botany, geology, topography, climatology, and all of the other environmental factors receiving the utmost attention.

The 29 habitat groups exhibited are the result of approximately the same number of expeditions to all parts of North America, and of the combined energies and talents of scientists, artists, preparators, and technicians—all of whom worked under the guidance of Harold E. Anthony, chairman of the Department of Mammals.

The first systematic archeological **survey of Catalina,** California's famous island, has been begun by Clement Meighan, in charge of the survey, E. V. Winans, and J. C. Hurst—all of the University of California at Los Angeles. Although the island resort is known to contain an abundance of Indian relics, no one has attempted to find out about the Indians who inhabited the island prior to the first Spanish visitors in 1542.

The Federal Civil Defense Administration, Washington, D.C., is exhibiting a prototype of its new **200-bed civil defense hospital.** The improvised hospital provides all equipment necessary to give rapid bed care to 200 disaster victims. It furnishes a casualty classification room, three operating rooms, shock treatment room, x-ray room with portable generator and transformer, laboratory, pharmacy, and wards. Completely mobile, it can be moved in a single van, set up at the disaster scene in any available building, such as a school, and can be in full operation 4 hr after arrival. States and cities may obtain the hospital through the Armed Forces Medical Procurement Agency for $26,435 on a matching fund basis with the Federal Government paying half the cost.

The American Telephone and Telegraph Company has announced that **Bell System patented inventions,** including the transistor, may be used without payment of royalties by American manufacturers of hearing aids. The Bell System offer is being made to hearing aid companies by letters from Western Electric.

The **Giauque-Kelvin temperature scale proposal**—the defining of the number system of the absolute, thermodynamic (Kelvin) temperature scale by assigning a number to the triple point of water as a single fixed point—probably will receive further consideration by the Commission on Symbols, Units, and Nomenclature of the International Union of Pure and Applied Physics at the coming meeting of the Union in London, July 8–10. Adoption of the proposal was recommended in 1948 by the Union and by the International Committee on Weights and Measurements, and in 1953 by the International Union of Pure and Applied Chemistry.

All that is needed to complete the adoption and to get the definition into use is approval, by the International Committee and the International Conference on Weights and Measures, of a defining number for the triple point. A National Research Council ad hoc committee has recommended that this number be made 273.170, which is the average of the recent experimental determinations of the triple-point temperature in several different countries.

The advantages claimed for the Giauque-Kelvin definition are: (i) the triple point offers greater precision than the ice point as a thermometric fixed point because as ice melts it surrounds itself with pure water, thus preventing intimate contact between the ice and air-saturated water; (ii) calibrations at the steam point, which are relatively more difficult and inaccurate, become unnecessary; (iii) the relation between the triple point of water on the Celsius (international) scale (0.010°C) and on the new scale will be fixed by definition; (iv) the probable errors in the "best" values for the gas constant R and the Boltzmann constant k can be reduced. The adoption of the proposal will in no respect affect the practical Celsius (international) scale, since the latter has its own independent definition based on six fixed points.

That a single fixed point, rather than two, be used to define the number system for the thermodynamic scale was proposed by J. P. Joule and Lord Kelvin in 1854, but was forgotten until W. F. Giauque, of the University of California, made it anew in 1939.

Scientists in the News

Robert F. Bacher, chairman of the Division of Physics, Mathematics and Astronomy at the California Institute of Technology, has been named acting dean of the faculty in the absence of **Dean E. C. Watson,** professor of physics, who is spending a year's leave in travel and research in Europe. Though Dean Watson has taken shorter trips, this is his first extended leave in the 35 yr since he joined the Institute faculty as an assistant professor in 1919.

The Maryland Branch of the Society of American Bacteriologists has made the following annual awards:

Werner Braun of Camp Detrick, the Barnett Cohen Award for his work on bacterial variations.

Marie H. Creel of the Maryland State Department of Health, the J. Howard Brown Award for her work on the detection of tubercle bacilli.

Thomas H. Brem, chief of the medical service of the Long Beach (Calif.) Veterans Administration Hospital for the past 5 yr, has been appointed director of clinical teaching and professor of medicine in the University of Southern California School of Medicine.

S. Stephen Chapman, instructor in the Department of Bacteriology and Immunology at the Harvard Medical School, has been appointed associate professor of microbiology in the University of Louisville School of Medicine, effective July 1.

The National Association of Corrosion Engineers' 1954 awards are as follows:

Irving A. Denison, known for his research in soil corrosion, the Willis Rodney Whitney Award in recognition of contributions to corrosion science.

E. H. Dix, Jr., whose contributions to better understanding of corrosion processes in aluminum and magnesium alloys date from 1919, the Frank Newman Speller Award for his achievements in corrosion engineering.

Lloyd Espenschied, coinventor with Herman A. Affel of the coaxial cable system, one of the major methods of transcontinental telephone and television transmission, has retired from the Bell Telephone Laboratories after 44 yr with the Bell Telephone System. A pioneer in the development of both wire and radio communications systems, Mr. Espenschied has been granted more than 100 patents for his inventions. He invented the radio altimeter, which foreshadowed the development of radar.

L. Kraeer Ferguson, professor of surgery at the Woman's Medical College of Pennsylvania, was recently guest lecturer at the Medical School of the University of the Dominican Republic on the subject, "Signficance of polypi in the colon." He was subsequently made an honorary member of the Asociación Médica Dominicana.

In April the Western Society of Engineers presented **Lillian Moller Gilbreth,** psychologist, research scientist, and industrial consultant, with the Washington Award for leadership in engineering. She is the first woman to receive the honor, which has previously had such recipients as Herbert Hoover, Orville Wright, Henry Ford, Arthur H. and Karl T. Compton, Charles F. Kettering, and Henry T. Heald.

Dr. Gilbreth, who lives in Montclair, N.J., is the widow of Frank B. Gilbreth. The Washington Award Commission has credited the Gilbreths with having set the trend in industry and architecture toward labor-saving techniques and design. Dr. Gilbreth is also well known as the mother of the large family described in the book, *Cheaper by the Dozen.*

Carlos Luis Gonzales, chief of the Division of Public Health of the Pan American Sanitary Bureau, Regional Office of the World Health Organization, has been appointed to the post of assistant director. Dr. Gonzales left the Venezuelan National Health Service, where he was director of public health, in August 1953 to join the staff of the Bureau.

George R. Harrison, dean of science at the Massachusetts Institute of Technology, received the award of the Society for Applied Spectroscopy at its annual meeting in May.

Clarence Lester Hogan, formerly of the Bell Telephone Laboratories, is now associate professor of Applied Physics in the Division of Applied Sciences at Harvard University.

At the annual meeting of the Society of American Bacteriologists, **Rollin D. Hotchkiss,** an associate member of the Rockfeller Institute for Medical Research, was presented with the $1000 Commercial Solvents Award for Outstanding Research in Antibiotics. Dr. Hotchkiss received the honor for his investigations on the basic mechanisms of antibiotic resistance and susceptibility in microorganisms. He worked principally with *Diplococcus pneumoniae,* the organism causing lobar pneumonia. One area of information resulting from his studies suggests that factors other than those in the antibiotic itself may influence the specific susceptibility or resistance to antibiotics by the microorganism. Dr. Hotchkiss's studies also constitute an important contribution to bacterial genetics, since they demonstrate that something in the nature of genetic linkages to other transforming substances may occur within the bacterial world. He was commended for "the fundamental nature of his investigations, the far-reaching biologic implications of the findings and the elegance of the experimental approach."

Morris S. Kharasch, University of Chicago chemist, has been named the first Gustavus F. and Ann M. Swift distinguished service professor of chemistry at the university. The professorship was established under the will of the late Charles H. Swift as a tribute to his father, the Chicago packer who helped to found the university, and to his mother, who was one of the university's greatest financial contributors.

In April, **Hans A. Krebs,** professor of biochemistry, Sheffield, England, presented a series of four lectures and conducted a number of seminars as visiting professor of physiological chemistry at the University of Wisconsin.

Thomas J. Killian, chief scientist of the Office of Ordnance Research, U.S. Army, at Durham, N.C., has been appointed dean of the School of Engineering and Architecture at the Catholic University of America.

R. Bruce Lindsay, Hazard professor of physics and chairman of the department at Brown University, has been named dean of the Graduate School, effective July 1.

Donald B. MacMillan, well-known explorer, has received the Bowdoin Prize of Bowdoin College in recognition of his Arctic explorations.

For inventing a way to detour excessive current due to lightning or other causes of short circuits on electric power lines and thus protect vital electric capacitors from damage, **Ralph E. Marbury,** engineer for

Westinghouse Electric Corporation, Pittsburgh, has received a $5000 "outstanding invention" award from his company.

On July 1, **Sedgwick Mead,** now associate professor and director of the Department of Physical Medicine at Washington University and director of the Department of Physical Medicine at Barnes Hospital, St. Louis, will become medical director of the California Rehabilitation Center at Vallejo. Sponsored by the Kaiser Foundation, the Center conducts the nation's largest nongovernmental program devoted to the neuromuscular rehabilitation of children and adults handicapped by various types of paralysis.

At the 50th annual meeting of the Society of Experimental Psychologists, Inc., **Neal E. Miller** of Yale University was awarded the Howard Crosby Warren Medal "for his distinguished contributions to the scientific investigation of the relationships between learning and emotional behavior, leading to an increased understanding of the development and fixation of emotional attitudes."

Herbert B. Nichols, information officer for the U.S. Geological Survey since 1949, has accepted appointment as manager of public information at the General Electric Research Laboratory, Schenectady.

Aura E. Severinghaus, associate dean, Faculty of Medicine, Columbia University, recently received the first Alpha Epsilon Delta Distinguished Service Award, consisting of a medal and citation, for his outstanding contributions to premedical education. Dr. Severinghaus and his colleagues conducted a survey of pre-professional education and published findings in *Preparation for Medical Education in the Liberal Arts College,* providing a body of information that opens up new prospects for the steady improvement of preprofessional education.

The New York City Cancer Committee has presented **Arthur Purdy Stout,** professor of pathology at Columbia University, with the Clement Cleveland Award for "outstanding work in the campaign to control cancer" in 1953.

M. J. Thirumalachar, mycologist who studied at the University of Wisconsin, has recently taken charge as chief mycologist at the Indian Government Penicillin Factory, Pimpri, Poona, India, after spending a year working with E. B. Chain at the Istituto Superiore Di Sanita in Rome, Italy. During his stay in Europe Dr. Thirumalachar visited laboratories in Italy, Germany, Switzerland, France, Holland, Denmark, and Norway.

Richard Trumball recently joined the staff of the Office of Naval Research in Washington as assistant head of the Physiological Psychology Branch. A former member of the faculty of Syracuse University, Dr. Trumball has just completed 2 yr of military service as a member of the staff of the U.S. Naval School of Aviation Medicine, Pensacola, Fla., and more recently, as assistant head of the Aviation Psychology Branch at the Bureau of Medicine and Surgery.

Peter A. van der Meulen, director of the Rutgers University School of Chemistry, has received the annual Honor Scroll of the New Jersey Chapter of the American Institute of Chemists.

John W. Wells of Cornell University will represent the National Academy of Sciences—National Research Council at the 2nd Congress of the Pan Indian Ocean Association that is to be held in Perth, Australia, Aug. 17–24. Dr. Wells is at present carrying out a research and teaching assignment with the Department of Geology of the University of Queensland, Brisbane.

Education

A 24,000,000-v **betatron** for the treatment and study of cancer and other biological and physical problems has been installed in the new Barnard Free Skin and Cancer Hospital by the Edward Mallinckrodt Institute of Radiology of the Washington University School of Medicine.

An **instructional television system,** built specifically for training purposes, was exhibited at the Armed Forces Communications Conference in Washington, D.C., May 6–7. It was developed by the Office of Naval Research at the Special Devices Center, Port Washington, N.Y. The simplified instruments were especially designed for use by ordinary classroom and laboratory instructors and eliminate the need for costly studio equipment and personnel that has made educational TV too expensive.

The prototype model displayed at the meeting had one Orthicon camera with provision for including two more. The camera, with its complete receiving and transmitting equipment and sound system, has been housed in a small, portable, desklike console. From this the TV program can be transmitted by cable to as many as 100 different receivers, located in as many different areas.

For technical skill training, it would be possible for each student to have a TV receiver at his work bench and follow the instructor's step-by-step process while watching TV close-ups. By using two cameras with the system, instructor and class can remain in the classroom while an assistant takes a camera to areas outside, thus saving valuable class time.

Specialists in the field of blood coagulation from medical centers throughout the United States and abroad participated in a 2-day conference on hemorrhage diseases May 21–22 at the **Marquette University School of Medicine.** The conference, held in conjunction with dedication of the new Eben J. and Helene M. Carey Memorial Library, $1,000,000 addition to the Medical School, was to honor Dr. Carey, late dean, and Armand J. Quick, professor and director of the Biochemistry Department.

Dr. Quick, during 20 yr of research in the field, has

brought world-wide attention to Marquette as a center for the study of blood coagulation. He received the American Medical Association's gold medal in 1944 and the Modern Medicine Award in 1954. Participants in the conference included Tage Astrup of Copenhagen and Alfredo Pavlovsky of Buenos Aires.

Pratt Institute will offer a program leading to the degree of **Master of Industrial Design** in the academic year 1954–55. Candidates must have a B.A. degree in design, architecture, or engineering and show promise in advanced design and product planning. A total of 32 semester hours is required for the degree.

The courses are also available to designers who may wish to do refresher work. Students will be expected to complete a number of projects based on objectives of the program. Major projects will include studies in design, structure, equipment, production operations, professional practices, and social and economic research. Field trips and special study in industrial designing and product planning are also included in the required work.

A recent issue of the *Journal of the American Dental Association* said editorially that federal **support of dental research** is far at variance with the nation's annual dental bill of more than a billion dollars. The *Journal* reported that only $229,607 in research grants had been allocated to the National Institute of Dental Research for the fiscal year ending next July, representing only 1.1 percent of the total U.S. Public Health Service grant budget of nearly $21 million for the year. For research fellowships, there were 11 awards in dentistry out of a total of 543 fellowships.

Most of the research work in the physical sciences being conducted at the **University of Arkansas** was integrated into the academic departments when the school's Institute of Science and Technology became a division of the College of Arts and Sciences on Jan. 1. The move was designed to make more effective use of both research personnel and research facilities.

Grants and Fellowships

The following **AAAS research grants** have been awarded:

California Academy of Sciences to L. E. Salanave. Photographic and photoelectric measurements of shadow bands.

Michigan Academy of Science, Arts, and Letters to Gertrude R. Kurath. Songs, dances and religious customs of modern Michigan Algonquians.

New Orleans Academy of Sciences to J. E. Tempesta, National University of Mexico. Purification of a glycoside with marked cardiac action.

South Carolina Academy of Science to J. R. Sampey, Furman University. Surveys of the literature in various medical fields.

Virginia Academy of Science to W. H. Lewis, University of Virginia. Cyto-taxonomic analysis of rosa species of Virginia and adjacent areas.

Virginia Academy of Science to K. W. King, Virginia Polytechnic Institute. Purchase of a monochromatic colorimeter.

The Air University of the U.S. Air Force announces its second series of research awards, beginning with the academic year 1954–55. Applications for two kinds of awards are invited:

1. **Air University Research Assistantships** are intended for graduate students in colleges and universities who have completed most or all of their course work for the doctorate and are ready to begin research on a doctoral dissertation problem. These 1-yr appointments carry with them compensation ranging from $3410 to $4205 per year.

2. Faculty members of civilian colleges and universities and staff members of research institutions may apply for 1-yr appointments as **Air University Research Associates.** Compensation ranges from $5060 to $7040.

The assistants and associates will have opportunities to work in the following fields: medical science, clinical medicine, military (aviation) medicine, maintenance engineering, sociology, anthropology, geology, geography, and botany. For detailed information concerning these awards, see the booklet, "Air University Awards," which may be obtained from the Commander, Air University, Maxwell Air Force Base, Ala.

The **American Dermatological Association** is again offering prizes for the best essays submitted for original work, not previously published, relative to some fundamental aspect of dermatology or syphilology. The purpose of this contest is to stimulate investigators to original work in these fields. Cash prizes will be awarded as follows: $500, $300, and $200 for 1st, 2nd, and 3rd place, respectively. Competition is not limited to physicians. The candidate winning first prize may be invited to present his paper before the annual meeting of the Association, with expenses paid in addition to the cash award.

The manuscript must be typed in English with double spacing and ample margins. Together with illustrations, charts, and tables, all of which must be in triplicate, it is to be submitted *not later than November 15* to Dr. J. Lamar Callaway, Secretary, American Dermatological Association, Duke Hospital, Durham, N.C.

Eight chemistry, engineering, and physics students have been awarded $1000 **Atlas Powder Company** senior-year college scholarships.

To encourage and assist promising young scientists, **Eastman Kodak Company** has offered 27 fellowships to a corresponding number of educational institutions for the year 1954–55. All for advanced study, 18 of the fellowships are in chemistry, 5 in chemical engineering, and 4 in physics. Each award provides $1400 and an allowance for tuition and fees. The fellowship also provides for a payment of $1000 to the institution to help support the cost of the research undertaken by the students.

The institution will select a student in the last year of study for his doctorate. The basis of selection is the student's demonstrated ability in his major field of study, a high degree of technical promise, and financial need. One purpose of the fellowship is to enable the

recipient to devote full time to a research project. As a provision of the award, Kodak will assist the recipient to attend one of the important scientific or professional meetings appropriate to the field of study.

The Lederle Laboratories Division of the American Cyanamid Company announces that it is making available to medical schools throughout the U.S. and Canada **"Lederle Medical Student Research Fellowships."** These fellowships, in amounts up to $600 per year for any one individual, are intended to relieve in part the financial burden of students who desire to devote their summer vacations to research in the basic (preclinical) medical sciences.

Applicants must have the consent of the faculty member under whose supervision their research is to be conducted. Selection of students to receive such awards will be made by the dean of the medical school, or by the regularly constituted committee of the faculty charged with such selections. By special permission of the dean or of the fellowship committee of the school, the student may carry on such research in another medical school provided that satisfactory arrangements are previously made with that school.

Trustees of the **National Society for Crippled Children and Adults** have voted to launch a research project into the cause of crippling diseases. The group, a federation of state, county, and municipal societies, has an annual $10,000,000 aid program. Previously, it spent virtually all of its funds in direct aid to the crippled.

During the first year, 0.5 percent of income of the national and state groups will be devoted to the research project, which will be directed by William T. Sanger, past president of the society and president of the Medical College of Virginia.

The American Chemical Society is now prepared to make grants for research in the petroleum field from the **Petroleum Research Fund** set up some years ago for administration by the Society. The grants will be made by the Society's board of directors to persons recommended by a newly appointed Petroleum Research Fund Advisory Board that is under the chairmanship of Cary R. Wagner of Utica, Ohio.

Requests for grants-in-aid should be in the form of a written proposal describing the work to be done, the qualifications of the investigator for such research, the facilities available, the extent to which teaching and training of students may be advanced by the study, and the amount of money desired. All proposals should be sent in triplicate to the Petroleum Research Fund Advisory Board, American Chemical Society, 1155 16 St., N.W., Washington 6, D.C. *The board will meet early in June to screen applications* received up to that time.

For purposes of these grants, the "petroleum field" is considered to include any area of fundamental research that, as stated in the trust agreement creating the fund, may lead to research directly connected with the petroleum field. Under the policy laid down by the board, the work must be done in a nonprofit institution, either in the United States or abroad, and all patents resulting from such work must be immediately dedicated to the public, royalty free.

The **Porter Fellowship of the American Physiological Society** for the year 1954–55 has been awarded to Alvin Brodish, a graduate student in the Department of Physiology of Yale Medical School. The Porter Fellowship is supported by the Harvard Instrument Company, which was founded by William T. Porter, late professor of physiology in Harvard Medical School. The fellowship is given every year to a student of physiology who shows great promise as a teacher and investigator.

The Italian Government, through the Cultural Relations Office of the Ministry of Foreign Affairs, offers **six fellowships** to American graduate students for study in Italy for a minimum period of 6 mo between October 1954 and July 1955. The Italian Embassy in Washington will pay $300 toward round-trip travel on an Italian ship or plane.

Men or women may apply in any field. Requirements include a master's degree or the equivalent in advanced work, such as recognition as an artist, scholar, or scientist. *Completed applications must be filed at the Institute by July 1.* For information write to the U.S. Student Department, Institute of International Education, 1 E. 67 St., New York 21.

Meetings and Elections

An alumni symposium in chemistry honoring **Roger Adams,** University of Illinois chemistry department head for 28 yr who is retiring Sept. 1, will be held in Urbana, Sept. 3–4. All who have been in the department under Prof. Adams' leadership—as undergraduates, graduate or postgraduate students, or staff members—are invited to the symposium, which is being organized by the organic chemistry group at the university at the request of Prof. Adams' 166 doctorate students.

Five former students, all members of the National Academy of Sciences, will present papers: Wendell M. Stanley, Nobel Prize winner and head of the University of California Virus Institute, Berkeley, "Chemistry of viruses"; John R. Johnson, head of organic chemistry, Cornell University, "Chemistry of gliotoxin"; Samuel M. McElvain, head of organic chemistry, University of Wisconsin, "Structure of nepatalic acid"; Ralph L. Shriner, acting chemistry department head, University of Iowa, "Chemistry of flavylium salts"; and Wallace R. Brode, associate director, National Bureau of Standards, "Steric factors and the color of organic molecules."

Ernest H. Volwiler, president, Abbott Laboratories, Chicago, who was Prof. Adams' first doctorate graduate at Illinois, will open the symposium and preside at the morning session; William E. Hanford, vice president in charge of research and development,

M. W. Kellogg Co., New York, will be in the chair for the afternoon session; and William H. Lycan, vice president in charge of research and development, Johnson and Johnson Co., New Brunswick, N.J., will officiate at the banquet. Arrangements have been made for publication of the papers presented. Reservations are being handled by Prof. Leonard E. Miller, Chemistry Department, University of Illinois.

Officers of the **American Eugenics Society** are: pres., C. Nash Herndon; v. pres., Harry L. Shapiro; sec., Frederick Osborn; treas. Chauncey Belknap.

On April 24 the **American Philosophical Society** elected the following officers for 1954–55: pres., Owen J. Roberts; v. presidents, George W. Corner, Alfred V. Kidder, and Oliver E. Buckley; secretaries, Richard H. Shryock and Henry Allen Moe; curator, Fiske Kimball; treas., Fidelity-Philadelphia Trust Company. Councilors, to serve for 3 yr, are: Donald H. Menzel, Mathematical and Physical Sciences; John S. Nicholas, Geological and Biological Sciences; Lewis W. Douglas, Social Sciences; and Lynn Thorndike, Humanities.

New members elected in the various mathematical, natural, and social sciences are: Crawford Hallock Greenewalt, Gaylord P. Harnwell, Charles C. Lauritsen, W. F. Libby, Kenneth S. Pitzer, E. M. Purcell, Manuel Sandoval Vallarta (Mexico), Ernst Cloos, Rene Dubos, Thomas Francis, Jr., David R. Goddard, Curt Stern, Ragnar Granit (Sweden), Solomon Fabricant, Grayson Kirk, Edward Sagendorph Mason, and Joseph J. Spengler.

The 49th annual meeting of the **American Urological Association** will be held in New York, May 31–June 3. There will be scientific and technical exhibits, motion pictures, and an essay competition, as well as technical reports by Association members. One of the features of the meeting will be the Guiteras Lecture, to be delivered this year by John Eager Howard. All physicians, including visitors from abroad, are invited to attend the scientific sessions.

Some 400 analytical chemists from all parts of country will convene at the University of Minnesota on June 18 for the 7th annual **Analytical Symposium of the American Chemical Society,** sponsored jointly by the Division of Analytical Chemistry and the Society's journal, *Analytical Chemistry.*

Methods of applying titration will be discussed at the symposium, which has as its topic "Recent developments in titrimetry." Philip J. Elving of the University of Michigan's department of chemistry is general chairman and I. M. Kolthoff, head of the analytical chemistry department at Minnesota, is honorary chairman. John E. Wertz of Minnesota is chairman of the committee on local arrangements.

The third postwar convention of the **British Institution of Radio Engineers** will be devoted exclusively to industrial electronics. The main theme is to show how electronics can increase qualitative and quantitative production, and production efficiency, in all branches of industry. The convention will be held at the University of Oxford, July 8–12.

Sir John Cockcroft, Director of Research, A.E.R.E., Harwell, will deliver the Institution's Clerk Maxwell Memorial Lecture. In addition, some 30 papers will be presented covering computers for industry and commerce, industrial x-ray equipment, the use of ultrasonics, nucleonic instrumentation, transducers in industrial production, and applications of electronics to process control. A program and reservation may be obtained from The Secretary, British Institution of Radio Engineers, 9 Bedford Square, London, W.C.1.

On Apr. 3, at San Francisco State College, the new **Far Western Section of the Association of Geology Teachers** was organized. This is the first section of the Association west of the Rockies. The following provisional officers were elected: pres., York T. Mandra, San Francisco State College; v. pres., Charles G. Higgins, University of California, Davis; sec.-treas., Robert M. Norris, Santa Barbara College.

The first regular business meeting of the section will be held at the national meeting of the Geological Society of America in Los Angeles in November. At that time, a regular slate of officers will be elected for 1955.

The **Federation of American Scientists** has announced the following officers for 1954–55: chairman, M. Stanley Livingston, professor of physics at Massachusetts Institute of Technology; v.-chairman, Ernest C. Pollard, professor of physics at Yale University and chairman of the Scientists' Committee on Loyalty and Security (FAS); sec., Lewi Tonks, research associate at the Knolls Atomic Power Laboratory, General Electric Company, Schenectady; treas., Arthur S. Wightman, professor of physics at Princeton University.

Other members of the Federation's newly elected Executive Committee are: William A. Higinbotham, Brookhaven National Laboratory; David L. Hill, Los Alamos Scientific Laboratory; and John S. Toll, University of Maryland.

A conference on the **Impact of Solid State Science on Engineering Materials** will be held at Carnegie Institute of Technology, June 21–25, under the joint sponsorship of the Institute, the American Society of Electrical Engineering, the National Science Foundation, and the University of Illinois. The objective is to bring to the attention of engineering educators the important recent contributions of solid state physics toward the understanding of properties of engineering materials and to encourage the incorporation of such learning into engineering curriculums.

Topics to be covered at the conference include, in addition to an introductory survey of the theory of the solid state, mechanical and thermal properties, adsorption, catalysis and corrosion, and finally, a physical basis of the properties of polymers, ceramics, plastics, and cements. Leading physicists and engineers

will discuss the basic theory and engineering applications associated with the respective phenemona, their understanding, and the possibility for future research and development.

Among those who will participate in the conference are: John Bardeen, University of Illinois; Harvey Brooks, Harvard University; K. Lark-Horovitz, Purdue University; T. A. Read, Columbia University; and J. E. Goldman, H. Jones, W. Leivo, H. Paxton, and R. Smoluchowski of Carnegie Institute of Technology. Engineering educators who wish to attend should write to John W. Graham, Jr., Assistant Dean, College of Engineering and Science, Carnegie Institute of Technology, Pittsburgh 13, Pa.

The **New Orleans Academy of Sciences** has elected the following officers for 1954: pres., John G. Arnold, Jr., Loyola University; v. pres., Willis Eggler, Sophie Newcomb Memorial College; sec., John H. Mullahy, Loyola University; treas., Philip Wakeley, Forest Experimental Station.

Officers of the **Society for Industrial Microbiology** for 1954 are: pres., James G. Horsfall, Connecticut Agricultural Experiment Station, New Haven; v. pres., H. B. Woodruff, Merck & Co., Rahway, N.J.; sec.-treas., C. L. Porter, Purdue University, Lafayette, Ind.; dir., C. W. Hesseltine, Northern Regional Research Laboratory, Peoria, Ill.

The annual **summer biological symposium** is to be held this year at the University of Michigan. All are invited to attend the meetings, which are to be on the subject of "Adaptations in microorganisms." The program follows:

July 12–16. Sol Spiegelman, University of Illinois: (1) "Transmission of enzyme synthesizing capacity;" (2) "Properties of the enzyme synthesizing mechanism." Joshua Lederberg, University of Wisconsin: (1) "Mechanisms of bacterial adaptation against chemotherapy"; (2) "Serological variations in Salmonella."

July 19–23. John R. Preer, Jr., University of Pennsylvania: (1) "Inheritance of adaptive responses in protozoa; (2) "Cytoplasmic factor, kappa, in paramecium." Francis J. Ryan, Columbia University: (1) "Randomness of mutation in bacteria;" (2) "Selective mechanisms in bacteria."

The program of the 13th annual **Symposium of the Society for the Study of Development and Growth** to be held at Dartmouth College, June 23–26, is as follows:

June 23. David R. Goddard, University of Pennsylvania, opening address; Roger Stanier, University of California, Berkeley, "Plasticity of enzymatic patterns in microbial cells"; Seymour Cohen, Children's Hospital, Philadelphia, "The transformation of bacterial metabolisms induced by virus infection"; Ralph Emerson, University of California, Berkeley, "The biology of water molds."

June 24. Dietrich Bodenstein, Army Chemical Center, Md., "Insect morphogenesis"; Clifford Grobstein, National Institutes of Health, "Tissue interaction in the morphogenesis of mouse embryonic rudiments in vitro"; E. S. Russell, Roscoe B. Jackson Memorial Laboratory, "Review of pleiotrophic effects of W-series genes on growth and differentiation."

June 25. Linus Pauling, California Institute of Technology, "Duplication of molecules"; Joseph S. Fruton, Yale University, "Biosynthesis of proteins and peptides"; James Ebert, Indiana University, "Aspects of protein biosynthesis in development."

June 26. Sterling Hendricks and Harry Borthwick, U.S. Department of Agriculture, Beltsville, Md., "Photoresponsive growth control"; Nelson T. Spratt, Jr., University of Minnesota, "Studies on the organizer center of the early chick embryo."

A **symposium on electrolytes** will be held by the American Chemical Society's Division of Physical and Inorganic Chemistry at Yale University, June 16–18. Peter J. W. Debye of Cornell University, Charles A. Kraus of Brown University, and John G. Kirkwood of Yale will be among the 31 speakers on the symposium program.

Miscellaneous

Signal and communications engineers, theater operators, radio and television technicians, manufacturers, and other persons engaged in work involving acoustical measurements now have available an **American Standard on Letter Symbols for Acoustics.** Published by The American Society of Mechanical Engineers under the procedures of American Standards Association, the new pamphlet lists more than 100 symbols. Copies may be obtained for $1.00 from the ASME, 29 W. 39 St., New York 18.

Preparation of the standard was begun in 1949 by a group under the chairmanship of Harry F. Olsen, RCA Laboratories, Princeton, N. J. The group operates under the Sectional Committee on Letter Symbols, chairman of which is H. J. Turner, associate professor of electrical engineering at Yale University. Established in 1926, the committee has now produced a total of 13 standards in letter symbols for mathematics, hydraulics, mechanics, structural analysis, heat and thermodynamics, illuminating engineering, aeronautical sciences, electrical quantities, radio, physics, chemical engineering, meteorology, and acoustics.

The following **chemicals** are wanted by the Registry of Rare Chemicals, Armour Research Foundation of Illinois Institute of Technology, 35 W. 33 St., Chicago 16: silicon disulfide; potassium monoxide; diethylphosphine; 3,4-dimethylpyridine; 9-decenoic acid; isobutylene oxide; 4-hydroxyphthalic acid; 3-methyl-2-naphthoic acid; 1-nitroheptane; 2,5-dimethyl-1,-4-dioxane; 2,5-dimethyl-1,5-hexadiene; 3-methoxy-3-ethyl-1,6-hexandiol; 2,6-diaminopimelic acid; esculetin; gentisic aldehyde; mycophenolic acid; lanosterol; elemicin; bromelin; creatininease.

The **Eye-Bank for Sight Restoration, Inc.,** 210 E. 64 St., New York 21, urgently needs eyes. The donation procedure instructions read: "Sign the release, have your signature witnessed, and give same to your next of kin, or to whoever will have charge of your burial arrangements. . . ."

Comprehensive listings of active **projects in food and nutrition research,** the laboratories, supporting organizations, and professional research personnel engaged in the research have been published as the results of surveys conducted by the Food and Nutrition Board of the National Research Council for 1947, 1948–49, and 1952–53. These publications list 4000 to 4800 projects, between 600 and 660 organizations conducting or supporting research, and the names of about 5000 professional research workers. Of the organizations listed, approximately 50 percent are industrial, 40 percent academic, and 10 percent governmental.

The research is classified by subject categories relating to physiology and biochemistry, food chemistry, food technology, microbiology, food acceptance, and nutrition education. Of the research projects recorded, approximately 40 percent pertained to nutrient metabolism and requirements (physiology), 30 percent to food chemistry and composition, 20 percent to food technology, and 10 percent to microbiology, food acceptance, and nutrition education. Between 1947 and 1953 there has been a possibly significant increase in the number of projects devoted to food technology and a decrease in the number devoted to food chemistry and composition.

The objective of the surveys has been to provide a published guide for research workers to use in finding promptly what research was done in a field of interest, where it was done and how financed, and who did it. The third survey was supported by contract with the U.S. Department of Agriculture, and the published volume will be available through the Government Printing Office.

The Scientific Monthly for June will feature these articles: "Geology and health," Harry V. Warren; "The Colorado Plateau Province as a field for Geological Survey study," Mary C. Rabbitt; "People, energy, and food," Warren Weaver; "Human relations and technical assistance in public health," E. Ross Jenney and Ozzie G. Simmons; "Science and social conservatism," Leonard Carmichael; "Blueprint for autobahn, U.S.A.," Paul F. Griffin.

Necrology

David Becker, 54, president of the American Academy of Dental Medicine, Montclair, N.J., May 6; **Gerald E. K. Branch,** 67, professor of chemistry at the University of California, Berkeley, Apr. 14; **Finn J. Bronner,** 66, author and professor emeritus of comparative anatomy, dental morphology and occlusion at New York University College of Dentistry, New York City, Apr. 12; **James E. Brooks,** 84, retired civil engineer and authority on mosquito control, Glen Ridge, N.J., Apr. 23; **Henry Bunting,** 43, associate professor of pathology at the Yale Medical School, New Haven, Conn., Apr. 15; **LeGrand H. Hardy,** 59, authority on the physiology of the eye, author, president of the American Orthoptic Council, and clinical professor of ophthalmology at the College of Physicians and Surgeons of Columbia University, New York City, Apr. 14; **Frederick D. Heald,** 81, author, former editor, and professor emeritus of plant pathology at Washington State College, Pullman, Apr. 24; **Wendell F. Hess,** 51, metallurgist, former president of the American Welding Society, and director of research at Rensselaer Polytechnic Institute, Troy, N.Y., Apr. 21; **Earnest A. Hooton,** 67, author and chairman of the Department of Anthropology at Harvard University, Cambridge, Mass., May 3; **Joseph S. Knapper,** 66, professor of chemistry and mathematics at Albright College, Reading, and Pennsylvania State University, State College, May 4; **Charles I. Lambert,** 76, medical director of Four Winds Hospital, Katonah, N.Y., former professor of psychiatric education at Teachers College, Columbia University, and former associate professor of psychiatry at Columbia's College of Physicians and Surgeons, New York City, Apr. 18.

Ellis L. Manning, 53, author and physicist for the Signal Corps Engineering Laboratories, Fort Monmouth, N.J., Mar. 27; **Harrison S. Martland, Sr.,** 70, research pathologist, author, pioneer in radioactive diseases, and retired professor of forensic medicine at New York University, New York City, May 1; **Herman O. Mosenthal,** 75, authority on diabetes, former president of the American Diabetes Association, and former director of the Department of Medicine at New York Post-Graduate Medical School, New York City, Apr. 24; **Chester N. Myers,** 69, research chemist and specialist in chemotherapy and skin diseases, Yonkers, N.Y., May 3; **Ira T. Nathanson,** 49, cancer specialist and associate clinical professor of surgery at Harvard Medical School, Boston, Mass., May 3; **James D. Pilcher,** 74, head of the Pediatrics Department at City Hospital, Cleveland, Ohio, May 4; **Swanie S. Rossander,** 50, author, inventor, and assistant director of the Jackson Laboratory, Wilmington, Del., Apr. 17; **Herman A. Shelanski,** 42, discoverer of blood plasma substitute and director of the Industrial Toxicology Laboratories, Philadelphia, Pa., Apr. 13; **J. J. Singer,** 71, specialist in chest diseases and associate professor of medicine at the University of Southern California, Los Angeles, Apr. 13; **Lewis J. Stadler,** 57, research geneticist, former president of the Genetics Society of America, and professor of field crops at the University of Missouri, St. Louis, May 12; **William O. Vanderburg,** 58, mining engineer and authority on mineral production and supply for the State Department, Washington, D.C., Apr. 16; **Jerald G. Wooley,** 64, former head of the clinical laboratory of the National Leprosarium and authority on animal nutrition requirements for the National Institutes of Health, Bethesda, Md., Apr. 20.