tion maintains seven research departments: the Mount Wilson and Palomar Observatories (in collaboration with the California Institute of Technology), the Geophysical Laboratory, the Department of Terrestrial Magnetism, Department of Plant Biology, Department of Embryology, Department of Genetics, and the Department of Archaeology.

Mr. Scherer takes the load off the president in the administration of this widespread operation and in addition shares many of Dr. Bush's scientific and inventive enterprises. At present he spends some of his time on the chilly waters of Chesapeake Bay experimenting with the hydrofoil craft that Dr. Bush and he have developed.

A hydrofoil craft is one that operates on foils or wings submerged below the surface of the water. The hull is attached to the foils by struts and rides above the surface of the water unaffected by wave action. Such a craft has many advantages, including greater stability and speed than conventional displacement craft, and a high degree of invulnerability to mines and torpedoes. Hydrofoil craft with surface-piercing hydrofoils are old—Alexander Graham Bell built a good one about 1920. But stable submerged hydrofoil craft are new. Dr. Bush and Mr. Scherer have made a number of inventions in the hydrofoil field, particularly with respect to stability and control, problems which in the past have limited the development of hydrofoil craft.

The Scherers make their home at Marietta, one of Maryland's famous old colonial homes, built around 1780 by Gabriel Duval, Associate Justice of the Supreme Court. It is thrown open to the public once a year, as part of Maryland's annual garden tour.

The Scherers have six daughters and twelve grandchildren.

News and Notes

Conference on the Validation of Scientific Theories, Boston, Dec. 27-30

DESPITE the immense technological successes of science in our time, there has been a widespread dissatisfaction. One has accused modern science for its emphasis on the material aspect of the world and for diverting the mind of modern man from human and spiritual interests. The humanities have developed almost segregated from the sciences. Philosophy, the key to the humanities, has become an isolated department, without much bearing upon the mind of present-day scientists. By the present Conference, an attempt was made for some improvement of this unsatisfactory situation by discussing in a strictly scientific way possible bridges between the natural and the social sciences, between the sciences and the humanities. Such bridges cannot be built without some elements of a common language and without a minimum of common philosophy.

The Conference was sponsored by the American Academy of Arts and Sciences in Boston, the Institute for the Unity of Science, and the National Science Foundation. The program committee consisted of Ph. Frank (Harvard) as chairman, H. Feigl (Minnesota), G. Holton (Harvard), H. Margenau (Yale), R. K. Merton (Columbia), R. J. Seeger (National Science Foundation), and R. H. Shryock (Johns Hopkins). The committee chose as the central problem of the Conference the "Reasons for the acceptance of scientific theories" because, in the solution of this problem, not only results of purely scientific research are involved, but equally considerations from the fields of social studies and the humanities, particularly from the philosophy of science.

In Symposium A (a joint session with AAAS Section L and the Philosophy of Science Association; R. J. Seeger, chairman) this central problem was formulated and the variety of its solutions outlined. *Ph. Frank* stressed the point that in the physical sciences a general theory, as the theory of relativity, is not accepted on the ground of mere agreement of its results with observed facts. The theory should also be "simple," in agreement with common sense, with prevailing philosophies and should allow an interpretation of the universe that can be used to support a "desirable" way of life. Since none of these requests can be completely met by a theory, the actual acceptance has always been the effect of a compromise. *W. Churchman* (Case Institute of Technology) showed by a logically elaborate argument that "inductive inference," the derivation of general theories from observed facts, includes always decisions that are not essentially different from "moral" decisions. *B. Moore* (Harvard) exemplified the role of a "desirable" way of life as a motive for the acceptance of theories by describing the effects of government action in the Soviet Union upon the presentation of scientific theories in writing and teaching. In the discussion, *E. Nagel* (Columbia), *E. C. Kemble* (Harvard), and *R. Rudner* (Tufts) elaborated on the logical and sociological aspect of theories.

Symposium B (*H. Margenau,* chairman) was devoted to the requirement that every theory should have an "operational meaning." *G. Bergmann* (Iowa) and *C. Hempel* (Yale) presented blueprints for a logical analysis of this concept. *R. B. Lindsay* (Brown) pointed out that theories that are actually used by the physicist contain some terms without operational meaning and asked *P. W. Bridgman* (Harvard) to comment on this fact. In the discussion, Bridgman described his personal part in the fight for "operational analysis;" it is necessary that a theory as a whole have operational meaning, but this is not necessary for each single term. *R. J. Seeger* and *S. S. Stevens* (Harvard) directed attention to some points in the

concept of "operational meaning" that need further elucidation.

Symposium C (*H. Feigl,* chairman) was devoted to psychoanalysis, a doctrine that has gained great practical importance although opinions about its precise status within the domain of the sciences have been divided. *Elsa Frenkel-Brunswik* (Berkeley) made a strong plea for the view that psychoanalysis is a science in the same sense as physics or biology; auxiliary concepts like "super-ego" or "libido" without direct operational meaning have the same logical status as "electron" or "neutron" in physics. *F. Skinner* (Harvard), however, pointed out that these psychoanalytical terms are rather harmful fictions that prevent us from grasping the correlations in the observable behavior of human beings. *J. Richfield* (Cincinnati) spoke from the viewpoint of a practicing psychoanalyst about the relation between theory and practice in this field. In the discussion *M. Lean* (Brooklyn College) and *M. Scriven* (Minnesota) commented on the problem from a philosophical angle, and *S. Margolin* (New York City) pointed at physiologican phenomena that could be interpreted as correlated with the subconscious.

The great variety of the criterions that are responsible for the acceptance of a theory becomes very clear if we turn to a very general theory. An example was discussed in Symposium D. To put the question bluntly, we ask: Is the human organism a machine? The problem was discussed by *W. Koehler* (Swarthmore) on the basis of his philosophy of physical and biological science, by *N. Rashevsky* (Chicago) as a biophysicist, and by *W. McCulloch* (MIT) on the basis of contemporary giant computation machines and the theory of feedback mechanisms (cybernetics). All speakers agreed that the conception of "machine" has lost its ancient simplicity and that the question should not be whether our organism *is* a machine, but whether the machine-theory is useful for the advance of our knowledge about organisms. It has developed that a great many features of organisms can be imitated by machines, but it is doubtful whether an organism as a whole can be duplicated by one single machine. *B. Mandelbrot* (Paris) spoke about laws of human speech that can be derived from a machine-theory.

Symposium E on "Science as a social phenomenon" (chairman, *G. Holton*) took up, in a more specific way, the topic of A. Three speakers presented examples of how the advance of science has been influenced by social factors. *H. Guerlac* (Cornell) discussed the favorable and unfavorable impact of the French Revolution upon the advance of science. *E. Boring* (Harvard) presented his views about how the climate of opinion of a period ("Zeitgeist") exerts a positive or negative influence upon scientific creativity. *A. Koyre* (Sorbonne) stressed the bearing of philosophical doctrines upon scientific theories, using as example doctrines that teach or reject the finiteness of space. In the discussion, *B. Barber* (Barnard), *K. Deutsch* (MIT), *R. S. Cohen* (Wesleyan), and *J. S. Bruner* (Harvard) stressed the necessity for more detailed and systematic research about the mutual interaction between the rise of scientific theories and social factors.

Symposium F (a joint session with AAAS Section K1; *P. W. Bridgman,* chairman) was devoted to the discussion of the attempts that have been made by *J. Q. Stewart* (Princeton) and his group to apply mathematical formulas directly to social phenomena by using analogies between physical and social laws.

PHILIPP FRANK

Harvard University

Science News

A new element, of atomic number 99, has been produced and identified at the Radiation Laboratory of the University of California. By bombarding uranium 238 with stripped nitrogen atoms at 100 million electron volts, the uranium atom was made to take up, in one step, the seven protons necessary to change uranium 92 into the new atom. At the same time there were added to the uranium atom enough elementary particles from the excited nitrogen to give the new element an atomic mass of 247, making it to date the heaviest atom on earth.

In three experiments a total of only 40 atoms of the element have so far been detected. These have resulted from experiments, not yet declassified, at Argonne National Laboratory, at Los Alamos, and at the University of California. Detection of the new element and measurements of its rate of radioactive decay were reported in the Jan. 1 issue of the *Physical Review* by Albert Ghiorso, Bernard Rossi, Bernard G. Harvey, and Stanley Thompson.

Atomic energy has been converted directly into electricity through a revolutionary **"atomic battery,"** using a waste product of atomic reactors. The waste product is strontium 90, which emits high-speed electrons that bombard pea-sized transistors. The transistors, themselves revolutionary in the field of electronics, in turn emit 200,000 slow-moving electrons for each high-speed electron striking the material from the strontium 90. This creation of electric current is strong enough to produce an audible tone in a telephone receiver.

The new Radio Corporation of America battery is the size of a thimble and has a life expectancy of 20 years. It is a climax to 40 years of scientific efforts aimed at converting the radiation of the atom's nucleus directly into electricity.

Tools used by a previously unknown people who lived in the Old Stone Age just after the days of Neanderthal Man were among the finds made in Shanidar Cave in northern Iraq by Ralph S. Solecki of the Smithsonian Institution. Dr. Solecki has named the people the **Baradost Culture** after the mountain in which the cave is located. Evidence of the people was found in the same cave in which Dr. Solecki discovered the bones of a 75,000-year-old baby last summer. The

Baradost people lived some time after the Old Stone Age child.

Shanidar Cave was recently visited by Dorothy A. E. Garrod, eminent archaeologist formerly of Cambridge University, England. Dr. Garrod, who has herself made excavations nearby in Iraq, confirmed Dr. Solecki's estimate of the age of his finds. She also regards the Baradost Culture as something previously completely unknown, but believes that it fills a gap between two other cultures previously known in Iraq, the Zarzi and the Hazer Merd cultures.

On Feb. 20 the **Clinical Society of the New York Polyclinic Medical School and Hospital** celebrated the 50th anniversary of its founding. Orrin Sage Wightman, one of the founders of the Society, was the guest of honor. He was formerly a professor of internal medicine and a member of the Board of Trustees of the institution. At present he is Chairman of the Board of Trustees of the New York Academy of Medicine.

The New York Polyclinic Medical School and Hospital is the pioneer postgraduate school in America and was founded in 1881. Physicians from every part of the world have visited it for postgraduate instruction in the various specialties of medicine and surgery. The hospital is a voluntary one with 400 beds and a very active out-patient department where over 100,000 patients are cared for annually without regard to race, color, or creed.

The U.S. Atomic Energy Commission has announced a regulation providing for issuance of uranium mining leases on certain public lands affected by the Mineral Leasing Act of 1920, particularly public lands covered by oil and gas leases. The regulation, **Domestic Uranium Program Circular 7,** is designed to encourage private companies and individuals to develop and produce uranium-bearing ores from public lands embraced within an offer, permit, application, or lease under the Mineral Leasing Act of 1920 or from lands which are known to be valuable for minerals leasable under that Act. Such lands are not open to mineral entry under the mining laws.

Copies of Circular 7 may be obtained from the Grand Junctions Operations Office of the Commission or from AEC offices located at Denver, Colo.; Hot Springs, S. Dak.; Douglas, Wyo.; Albuquerque, N. Mex.; Phoenix, Ariz.; Richfield and Salt Lake City, Utah.

Morphine can now be synthesized by a new method from coal tar products. The research was done at the Weizmann Institute of Science, Rehovet, Israel, by Dov Elad and David Ginsburg. It supplements a method announced in 1952 by Marshall Gates and Gilg Tschudi of the University of Rochester, N.Y.; their synthesis was the first solution to a long-standing chemical puzzle.

The new synthesis starts with phenanthrene, a three-ring carbon compound that occurs in coal tar. The earlier one began by using Schaeffer's acid, an aniline dye intermediate. Each builds up to a compound of Thebaine, or paramorphine. From there the conversion to morphine and its derivative, codeine, is the same in each process. The long and complicated procedures for artificial production of genuine morphine would make its manufacture too costly at the present time, but, once the key to a new chemical has been found, short cuts to cheapen its cost of production usually can be worked out within a relatively short time if need for the product is felt.

Scientists in the News

Homer L. Dodge, president emeritus of Norwich University and formerly professor of physics and dean of the graduate school at the University of Oklahoma, has completed the organization of the Cabot Program of Aviation at Norwich that has occupied his time since his retirement from the presidency in 1951. He is now living in Burlington, Vt., and devoting himself principally to travel lecturing in which he became interested with the advent of color photography. Last summer Dr. Dodge and his son Norton completed successfully the first trips ever made by canoe on the San Juan and Colorado Rivers from Mexican Hat, Utah, to Lees Ferry, Ariz., and on the Colorado from Hite, Utah, to Lees Ferry, a total distance of 355 miles in one of the most inaccessible parts of the United States.

In November the Louisville Surgical Society awarded the first David W. Yandell Medal to **Emile Holman,** professor of surgery at Stanford University. The annual award and lectureship were instituted to honor the memory of David W. Yandell, founder of the Society, who was professor of surgery in the University of Louisville School of Medicine from 1869 to 1898.

Jack Henry Jefferson has been appointed an associate professor in the Department of Chemistry of Southern University, Baton Rouge, La.

Walter Leighton, Jr., professor and chairman of the Department of Mathematics at Washington University, St. Louis, will assume a new position as head of the Department of Mathematics at the Carnegie Institute of Technology on July 1.

Victor L. Loosanoff, director of the U.S. Fish and Wildlife Service Marine Biological Laboratory, Milford, Conn., has been appointed honorary professor of zoology in the Graduate School of Rutgers University.

Three scientists are included among the ten outstanding young men of the year selected by the U.S. Junior Chamber of Commerce. They are: **Albert Schatz,** director of research and professor of microbiology, National Agricultural College, co-discoverer of Streptomycin; **Bernard J. Miller** of Laverock, Pa., surgeon research worker, and originator of a revolutionary heart-lung machine; **Maynard Malcolm Miller,**

geologist and explorer whose knowledge of glacier areas has been of great value to the armed services.

Roger W. Sperry has assumed his new duties as Hixon professor of psychobiology at the California Institute of Technology. Previously Dr. Sperry held a joint appointment as research associate in psychology at the University of Chicago and as chief of the Section on Developmental Neurology at the National Institute of Neurological Diseases and Blindness, National Institutes of Health, Bethesda, Md.

William H. Sutcliffe, Jr., staff biologist since 1951, has been appointed director of the Bermuda Biological Station. With this appointment, the Station enters on a new phase of its program in the promotion and support of marine research. In addition to its excellent location, the laboratory has much to offer to its staff and to visiting investigators. A motor launch and 61-ft research vessel are available, and laboratory accommodations with running seawater and ordinary supplies and equipment can be provided for about 25 persons. There is a library containing a working collection of books, serials, and reprints. Comfortable living quarters are available on the 14-acre station.

Membership in the Corporation of the Bermuda Biological Station is international and open to all who are interested. The officers and trustees who comprise its governing board are from Bermuda, Canada, Great Britain, and the United States. For details of the facilities and program, address the Director, Bermuda Biological Station, St. George's West, Bermuda.

The Office of International Relations, National Academy of Sciences—National Research Council, has provided the following information concerning the travel plans of scientific **visitors to the United States:**

A. G. Cock, Poultry Genetics Station, Cambridge, England; Agricultural Research Council. Arrived Dec. 3 for a 6-mo. stay at Purdue University (Prof. D. C. Warren) and University of California, Berkeley (Prof. I. M. Lerner).

J. W. B. King, Agricultural Research Council's Animal Breeding Research Organization, Edinburgh, Scotland. Arrived Dec. 22 for about 6 mos. to study population genetics with J. L. Lush, Iowa State College.

L. J. Mordell, Sadleirian professor of pure mathematics, University of Cambridge, England. Arrived in October and will be with the Mathematics Department, University of Toronto, until September.

Olavi Valdemar Perasalo, Assistant Chief Physician, University of Helsinki Hospital; surgeon, Helsinki Municipal TB Hospital, Finland. Arrived Dec. 9 for a 3-mo. stay to become acquainted with thorox surgery, especially heart and vein surgery. (Dr. Philip Owen, National Research Council, Washington, D. C.)

The Rt. Hon. Lord Rothschild, Director of Research, Dept. of Zoology, University of Cambridge, England. Here January through March.

Sir Robert Watson-Watt, F.R.S. Governing Director, Sir Rob't Watson-Watt & Partners, Ltd., London. Will be in Canada and the United States frequently in 1954. (Adalia Ltd., 306 Castle Building, 1410 Stanley Street, Montreal.)

D. Woodcock, Agricultural Research Council's Long Ashton Research Station, Bristol, England. Arrived Jan. 21 for about a 6-mo. stay to study organic chemistry as it relates to agriculture with Prof. W. M. Hoskins, University of California.

Education

The sixteenth session of the semi-annual **Philips X-ray Diffraction School** for registrants who find it convenient to visit New York City will be held at the plant of North American Philips Company, Inc., 750 South Fulton Ave., Mount Vernon, N.Y., during the week of April 19–23. Registration for the week-long school will be limited to 125 for the first four days and to 150 on Friday, this day being devoted to actual application problems when guest speakers discuss details on methods currently in use in research and industrial laboratories and plants. Since applications for attendance at the school held last October far outnumbered the available accomodations, it is recommended that those who wish to attend the coming session make reservations immediately. There is no registration fee. Philips held its first west coast X-ray Diffraction School last August for registrants in the San Francisco area; this western school will be repeated annually and registrations may be sent in now.

The **Rice Institute** has established a special curriculum designed to give engineering students in all major branches of engineering an essential knowledge of the nature of nuclear physics. The establishment of this curriculum is the Institute's answer to the increasing need for training in nuclear physics among students of mechanical, chemical, electrical, and civil engineering.

The new program will enable certain selected students in all four branches of engineering to take in their fourth or fifth years a course in nuclear physics given by members of the Physics Department and experts in this field, thus meeting the demand of individual companies and government for people with a knowledge of nuclear fundamentals. The new curriculum will be available in September, 1954.

A new Burch reflecting microscope, one of only two in the United States, has been installed in the micro-spectroscopic laboratory of the **University of Rochester.** The microscope is one of seven that are being built in England and is named after its designer, C. R. Burch, University of Bristol physicist. Its development and construction was supported by the Nuffield Foundation of England. The installation of both microscopes, one at Rochester and one at the Naval Research Laboratory, Washington, D.C., was directed by W. John Bates, an English physicist who helped supervise their construction.

A unique feature of the Burch instrument is its

main concave reflecting mirror, 3.5 in. in diameter, which is not spherical as in other reflecting microscopes. It is aspherical by 0.007 in. and this shape is produced with a precision of about 2×10^{-6} in. Unusually perfect images result. Mechanically, the microscope differs from others in that all moving parts slide on ball bearings mounted in V-grooves; this provides a high degree of motion accuracy. The University of Rochester microspectroscopic laboratory, located at the Medical Center, is under the direction of Theodore Dunham, Jr., a spectroscopy expert who for nearly 20 years was associated with the Mt. Wilson Observatory in California.

Grants and Fellowships

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

Oklahoma Academy of Science to Allen D. Linder, Dept. of Zoology, Oklahoma A. and M. College. The propagation and habits of darters of the genus *Etheostoma.*

Florida Academy of Science to Coleman J. Goin, Dept. of Biology, University of Florida. Preparation of a volume containing the original descriptions of all North American salamanders.

Florida Academy of Science to Howard K. Wallace, Dept. of Biology, University of Florida. Ecology, distribution, taxonomy, life history, etc., of spiders particularly of the families Lycosidae, Salticidae, Ctenizidae, and Atypidae, of Florida.

Indiana Academy of Science to S. S. Visher, Indiana University. A study of population changes in Indiana.

Indiana Academy of Science to L. S. McClung, Dept. of Bacteriology, Indiana University. The study of the characteristics of strains of the genus *Clostridium.*

Indiana Academy of Science to Fay Kenoyer Daily. To obtain data for use in the biological survey of Indiana.

Oregon Academy of Science to Williard B. Bleything, Pacific University. Various forms of disparate targets, in combination with filter systems for the producing of a phenomenon of three-dimension seeing.

Washington Academy of Science to Alfred Weissler, University of Maryland. Application of ultrasonic waves to chemical problems.

Washington Academy of Science to Herbert C. Hanson, Catholic University of America. Relationship of grassland communities to environmental conditions, particularly soils.

Georgia Academy of Science to John P. Knudsen, Oglethorpe University. Specific relationships and pupal coloration in the papilio machaon complex of Swallowtail butterflies.

Kentucky Academy of Science to Sister Virginia Heines, Nazareth College. Sugars in the *Phytolacca americana* berry.

Kentucky Academy of Science to O. J. Stewart, University of Kentucky. Investigation of the homing instinct of pigeons.

Texas Academy of Science to Richard J. Baldauf, Texas A. and M. College. Contributions to the cranial morphology of the Bufonidae.

Arkansas Academy of Science to Z. V. Harvalik, University of Arkansas. Reflectivity of metal films deposited at various low pressures.

Southern California Academy of Sciences to Louis C. Wheeler, University of Southern California. Rafinesqueian specimens of Euphorbiaceae.

Michigan Academy of Science, Arts and Letters to Gertrude P. Kurath, University of Michigan. Michigan Indian music and dances in Cross Village and Mount Pleasant.

Michigan Academy of Science, Arts and Letters to Warren H. Wagner, University of Michigan. Chromosome numbers in ferns.

British Columbia Academy of Science to Robert W. Kennedy, University of British Columbia. Fungicidal toxicity of certain extraneous components from Douglas Fir Wood.

British Columbia Academy of Science to P. G. Morris, University of British Columbia. Petrology of the igneous rocks near Hell's Gate, B.C.

The **Atomic Energy Commission** has awarded the following unclassified physical research contracts:

University of Alabama. J. L. Kassner and E. L. Grove. Study of the principles, theory, and practice of high-frequency titrimetry, $6750.

University of Arizona. E. B. Kurtz, Jr. Study of uranium accumulation in plants, $2600.

California Institute of Technology. J. W. M. DuMond. Precision nuclear spectroscopy, $57,813.

University of California. J. A. Pask. Mechanics of metal-ceramic bonding, $12,500.

University of California. C. S. Garner. Isotopic exchange reactions, $14,410.

University of Southern California. H. H. Friedman. Solutions of inorganic electrolytes in solvents of low dielectric constant, $10,000.

Carnegie Institute of Technology. J. E. Goldman. Properties of rare metals, $12,312.

Carnegie Institute of Technology. G. Derge. Electrochemical studies of non-aqueous melts, $30,000.

Carnegie Institute of Technology. T. P. Kohman. Nuclear chemistry research, $42,552.

Columbia University. J. M. Miller. Research in the field of radiochemistry, $25,240.

Columbia University. C. H. Townes. Microwave spectroscopy, $20,500.

University of Connecticut. R. Ward. Tracer element distribution between a solid and a melt, $9000.

Illinois Institute of Technology. T. J. Neubert. Investigation of imperfections in solids, $5472.

Illinois Institute of Technology. G. Gibson. Fundamental chemistry of uranium, $7569.

Massachusetts Institute of Technology. C. D. Coryell and D. N. Hume. Nuclear chemistry research, $141,700.

University of Michigan. P. Elving. Polarographic behavior of organic compounds, $12,400.

University of Michigan. E. F. Westrum, Jr. Low temperature chemical thermodynamics, $8316.

Northwestern University. F. Basolo and R. G. Pearson. Mechanism of substitution reactions of inorganic complexes, $6696.

Oregon State College. T. H. Norris. Study of generalized acid-base phenomena with radioactive tracers, $7028.

University of Oregon. D. F. Swinehart. Study of gaseous chemical reaction kinetics, using a mass spectrometer, $9000.

Pennsylvania State College. W. C. Fernelius. Stabilities of coordination compounds and related problems, $15,000.

University of Pennsylvania. W. F. Love. Solid state physics at low temperatures, $12,000.

University of Pittsburgh. R. Levine. Synthesis of beta-diketones and beta-ketoesters with heterocyclic nuclei, $8500.

University of Pittsburgh. W. E. Wallace. Application of chemical thermodynamics to the study of metallic alloy formation, $13,702.

University of Pittsburgh. H. Freiser. Development and testing of organic reagents for use in inorganic analysis, $8500.

Purdue Research Foundation. H. C. Brown. Chemistry of polyvalent metal halides, $11,500.

Purdue Research Foundation. E. Bleuler. Research in nuclear reactions with fast alpha particles, neutrons, and deuterons and a study of nuclear structure, $50,000.

Purdue Research Foundation. R. M. Whaley. Basic research using high energy electrons and x-rays produced by a 300 mev synchrotron, $80,000.

Purdue Research Foundation. K. Lark-Horovitz. Linear electron accelerator for nuclear physics, $15,000.

Sylvania Electric Products, Inc. W. E. Kingston. Self-diffusion and high temperature phenomena, $40,000.

Syracuse University. L. Gordon. Coprecipitation studies, $12,500.

University of Tennessee. E. E. Stansbury. Studies on the direct measurement of the energy changes resulting from plastic deformation and phase transformations, $8300.

University of Tennessee. P. B. Stockdale. Investigation of the Chattanooga Black Shale as a source of uranium, $46,148.

University of Tennessee. H. A. Smith. Rates of catalytic reactions involving deuterium; and the relative vapor pressures of water and deuterium oxide in the presence of certain salts, $6402.

Vanderbilt University. M. D. Peterson. Radiation stability and inorganic radiochemistry, $22,100.

Virginia Engineering Experiment Station. N. F. Murphy. Mass transfer studies in liquid-liquid extraction, $2673.

University of Washington. J. H. Manley. Sixty-inch cyclotron program, $100,000.

Washington University. J. W. Kennedy. Generation of high voltages by means of nuclear radiations, $17,000.

University of Wichita Foundation for Industrial Research. L. L. Lyon. Permeability method of determining surface areas of finely divided materials, $15,300.

State University of Iowa. L. Eyring. Preparation of rare earth oxides, $9000.

Northwestern University. J. N. Pitts, Jr. Investigation of the photochemistry of organic acids, ethers, and ketones, $5500.

University of Wisconsin. J. R. Dillinger. Low temperature research, $8095.

Columbia University offers the following graduate opportunities in **botany** for 1954–55:

Industrial fellowships in plant biochemistry. For the study of polyphenolic pigments in plants, the inheritance and production of alkaloids in the Oriental Poppy, the biosynthesis of plant products using radiocarbon, and the chemistry of floral initiation. $1800–2400. Prof. R. F. Dawson.

Research assistantships in cytogenic and cell physiology. Two of these assistantships for the study of nucleic acid and nucleoprotein metabolism in cells using radioisotopes and autoradiographs are supported by an AEC grant. $1800. Prof. J. H. Taylor.

Research assistantships in cellular morphology. Several are available. Prof. E. B. Matzke.

Teaching assistantships in various areas. $1300 with free tuition.

For further information and application forms, address the professor concerned at Department of Botany, Columbia University, New York 27.

A fund of $238,500 for grants to universities and colleges to advance the teaching of science has been announced by the **Du Pont Company.** This new part of the company's program of aid to education is the result of an experimental plan announced last year. Reports coming in from many of the institutions receiving Du Pont grants indicate that they have a special need of assistance in the development of science teaching. In recognition of this need, the company has now made advancement of teaching the largest single part of its aid-to-education program, which for many years has also provided grants for fundamental research and postgraduate fellowships. Under the whole program it has authorized a total of more than $700,000 for the 1954–1955 academic year as compared with $600,000 for 1953. In the longer standing plans in the program, the company is granting $230,000 for fundamental research and $222,000 for postgraduate fellowships in science and engineering.

There are four separate plans in the new development: $100,000 to advance the teaching of chemistry in colleges; $73,000 for postgraduate teaching fellowships in chemistry; $25,500 for summer research grants for chemistry teachers in universities; and $49,000 for fellowships for master's degree training of high school science and mathematics teachers.

As is the case with its long-standing program of fellowships and grants-in-aid, Du Pont is making the new awards to selected institutions and is leaving decisions on detailed use of the funds up to them. Under the long-established program, the company is awarding 61 postgraduate fellowships in scientific fields, granting 26 in chemistry, 17 in chemical engineering, six in biochemistry, five in physics, four in mechanical engineering, and three in metallurgy. It also is continuing its grants-in-aid of $15,000 each to ten universities and $10,000 each to six universities. These grants are to build up knowledge through the support of unrestricted fundamental research in chemistry.

The **Jack Kriendler Memorial Foundation** recently gave $40,000 to the **New York Heart Association.**

The **National Multiple Sclerosis Society** has announced the following research grants:

National Agricultural College. A. Schatz, Dept. of Microbiology. Myelin research.

New York University College of Medicine. p. J. Harman, Dept. of Anatomy. Phenomenon of demyelination in the central nervous system of genetically-controlled rabbits and mice.

Mt. Sinai Hospital. H. Sobotka. Specific metabolism patterns in neurological disease, based on findings of the vitamin content in the cerebrospinal fluid of multiple sclerotics.

Washington University. E. Robins, Dept. of Psychiatry, and D. E. Smith, Dept. of Pathology. White matter in the central nervous system.

Militaerhospitalet, Copenhagen, Denmark. P. Thygesen. Effects of ACTH and cortisone in extremely high doses over long periods of time.

The following grants from the **National Vitamin Foundation, Inc.,** became effective Dec. 31, 1953:

Philadelphia Lying-In Hospital. W. T. Tompkins. Statistical analysis of results of 5-year clinical study on the significance of nutrition and nutritional deficiencies in pregnancy, $5000.

Johns Hopkins University. B. F. Chow. Metabolic role of vitamin B_{12}, $3000.

Western Reserve University. A. E. Axelrod. Role of nutrition factors in antibody production, $16,200.

University of California. M. M. Nelson. Multiple congenital abnormalities produced by maternal vitamin deficiencies, $3000.

Michael Reese Hospital. B. M. Kagan. Normal and pathologic physiology of vitamin A, $5000.

Western Reserve University. I. T. Kline. Pantothenic acid in the biosynthesis of steroids, $4000.

Vanderbilt University. W. J. Darby. Requirement and physiologic effects in the human of the newer hemopoietic vitamins, $5575.

To help meet the higher cost of graduate education, **Socony-Vacuum Oil Company, Inc.,** will increase the value of its research fellowships from $2000 to a maximum of $3000 each for the year 1954–55. Under the new plan, schools will normally receive $750, while married men will get $2250 and single men $1750. The company and its affiliates are maintaining fellowships for the 1953–54 academic year at the following institutions:

Socony-Vacuum Oil Company: Brooklyn Polytechnic Institute, Brown, Colorado, Colorado School of Mines, Columbia, Georgia Tech, Harvard, Illinois, Johns Hopkins, Lehigh, Michigan, Notre Dame, Ohio State, Pennsylvania, Wisconsin, Yale.

General Petroleum Corporation: California Institute of Technology; Southern California.

Magnolia Petroleum Company: Louisiana State, Rice Institute, Texas, Texas A & M, Tulane.

The institutions select recipients from students with at least one year of graduate work. Grants do not obligate the fellows as to future employment. Similarly, recipients are free to study subjects not connected with the petroleum industry. There are no restrictions on the publication of the results of investigations.

The **University of Pittsburgh** has received $15,000,000 grant for medical education from three local foundations, each of which contributed $5,000,000 They are the A. W. Mellon Educational and Charitable Trust, the Richard King Mellon Foundation, and the Sarah Mellon Scaife Foundation. The principal purpose of the grants is to enable the School of Medicine to strengthen and extend its program of developing a permanent faculty to augment the present staff, most of whom are part-time members.

Meetings and Elections

The American Society of Heating and Ventilating Engineers has elected the following officers for 1954: pres., Louis N. Hunter, National Radiator Co., Johnstown, Pa.; 1st v. pres., John E. Haines, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.; 2nd v. pres., John W. James, McDonnell & Miller, Inc., Chicago, Ill.; treas., E. R. Queer, Pennsylvania State College, State College, Pa.

Anthropologists and folklore scholars joined together for meetings at the University of Arizona Dec. 28–30. Approximately 400 scholars from all parts of the United States attended, and world-wide progress in anthropological research was discussed by 133 speakers at 18 different sessions. An all-day symposium on the Southwest, under the chairmanship of Emil W. Haury, head of the University of Arizona Anthropology Department and director of the Arizona State Museum, covered the whole range of human progress in this area, from 10,000 years ago to the present. New reports on American folkways were presented by 18 folklore scholars who discussed the latest findings concerning old legends and folk songs that underlie this country's cultural heritage.

The meetings climaxed with a symposium on Indian affairs and the twenty-year record of the Indian Reorganization Act. Among those participating in this forum, which was arranged by William H. Kelly, director of the University's Bureau of Ethnic Research, were: Allan G. Harper, director of the Window Rock office, Bureau of Indian Affairs, chairman; John Collier, former commisioner of Indian Affairs, and professor of anthropology and sociology, City College of New York; Theodore Haas, former chief counsel, Bureau of Indian Affairs; Clarence Wesley, chairman, San Carlos Apache Tribal Council and president of the Arizona Inter-Tribal Council; and Clyde Kluckhohn, professor of anthropology, Harvard University.

Five national organizations participated in the program. The American Anthropological Association held its 52nd annual meeting jointly with the 65th annual meeting of the American Folklore Society. Co-sponsors were: The American Association of Physical Anthropologists, The American Ethnological Society, The Society for Applied Anthropology, and the Western States branch of the American Anthropological Association.

On Apr. 8–9 the **First Conference on Micro-circulatory Physiology and Pathology** will be held at the University of Texas, Galveston, under the sponsorship of the American Association of Anatomists. The conference will be devoted to a discussion of the techniques used to study living blood vessels and blood flow with the microscope. Detailed information may be obtained from E. H. Bloch, Western Reserve University, Cleveland 6, Ohio.

Seventy-two members of the **National Conservation Committee of the National Association of Biology Teachers,** representing 34 states, participated in a three-day work conference as a part of the annual meetings of the AAAS. Richard L. Weaver of the University of Michigan is chairman of the Committee and leader of its Conservation Project. The state and regional chairmen for the Project, assisted by 10 members of an advisory committee and the executive committee, edited a 360-page manuscript, "Handbook on Teaching Conservation and Resource-use Education," that will be published in 1954 by Interstate Press of Danville, Ill. The handbook will contain over 150 descriptions of conservation projects or programs from 30 states submitted by teachers through the members of the National Conservation Committee.

The Conservation Project has been underwritten for the first three years by a $10,000 grant-in-aid from the American Nature Association. The National Committee decided at its annual meeting to continue as a permanent project and committee of the National Association of Biology Teachers, in order to implement

some of the current projects and to expand the program in the areas of teacher training and state cooperation. Additional descriptions of outstanding school programs will be solicited and published in the journals of the many national organizations who have representatives on the advisory committee.

A new program to be cosponsored with the U.S. Soil Conservation Service under the direction of Bert D. Robinson will be the publication of an annual summary of all workshops in conservation education. Additional information on the Conservation Project and about the publications currently available should be addressed to Dr. Richard L. Weaver, P.O. Box 2073, Ann Arbor, Mich.

Under the sponsorship of the Wildlife Management Institute, the **19th North American Wildlife Conference** will take place in Chicago, Mar. 8–10. All phases of restoration and management of natural resources are scheduled for discussion. The programs for the sessions have been correlated and will be appraised at the close of the conference under the general theme "Natural resources—whose responsibility?" The Proceedings will be published by the Wildlife Management Institute, 709 Wire Bldg., Washington 5, D.C.

The **Pakistan Association for the Advancement of Science** held its sixth annual meeting in January with delegates from eight nations attending. Detlev W. Bronk, president of the National Academy of Sciences and past president of the AAAS, had been invited to represent the U.S., but could not be present. Self-help programs were stressed. The agenda included discussions on agriculture, chemistry, education, irrigation, public health, engineering, and forestry.

A unique event is scheduled for May 24–27 at the University of Michigan when, for the first time, the makers and users of instruments for industrial hygiene will be brought together at a technical and scientific symposium. This **Symposium on Instrumentation** is designed to make known to both groups what is available and what is needed in the field. The event, copresented by the University's Institute of Industrial Health and School of Public Health, will be of special interest not only to manufacturers and industrial hygienists, but also to physicists, chemists, safety engineers, meteorologists, noise investigators, engineers and others in related fields. The program will include exhibits, general sessions and technical papers on instrumentation in the following areas: sampling and analyzing for air contaminants in work places; laboratory-type instruments for industrial hygiene; atmospheric pollution evaluation; air velocity and metering of air; sound and vibration; ionizing radiations; and "home-assembled" instruments. Periods will be scheduled to permit the users of instruments to examine and exchange information with manufacturers' technical representatives. Facilities and program time will be allocated for manufacturers to schedule lectures, demonstrations, and group discussions of their own instruments. An important publication will grow out of the symposium—an illustrated book that will include technical data supplied by the instrument manufacturers.

The symposium has been officially endorsed by and is receiving enthusiastic support from the Scientific Apparatus Makers Association, American Industrial Hygiene Association, and American Conference of Governmental Industrial Hygienists. For further information write to Director, Continued Education, School of Public Health, University of Michigan, Ann Arbor.

The Johns Hopkins University School of Hygiene and Public Health and The National Vitamin Foundation are sponsoring a **"Symposium on problems of gerontology"** to be held on Mar. 2 at the Biltmore Hotel, New York City, in conjunction with the 9th annual meeting of The National Vitamin Foundation. The published proceedings will be available throughout the Foundation, 15 E. 58 St., New York 22.

Miscellaneous

In January the first issue of ***Industrial Science and Engineering*** was released. This is a science news magazine designed exclusively to assist students in adequate preparation for a career in some phase of industrial technology. The publication is planned to enable students to get a composite view of the many phases of industrial science, whether their interest lies in sales, research, administration, or production.

From the time of the inception of the Meteoritical Society in 1933, its "Notes and Contributions" were published regularly in the monthly magazine, *Popular Astronomy,* until December, 1951, when that periodical was discontinued on the completion of its 59th volume. By arrangement with the University of New Mexico and by unanimous vote of the Council of the Society, a new publication entitled ***Meteoritics: The Journal of the Meteoritical Society and the Institute of Meteoritics of the University of New Mexico*** was established, and its first issue, consisting ing of 25 items and 123 pages, appeared in December, 1953.

Meteoritics is to be issued at least once but not more than four times a year. It is expected that eventually the journal will become a quarterly. Each volume is intended to contain from 240 to 360 pages. The editor of the Meteoritical Society, Frederick C. Leonard of the University of California, Los Angeles, is the editor of *Meteoritics,* and the director of the Institute of Meteoritics of the University of New Mexico, Lincoln LaPaz, is the associate editor. The annual subscription price of *Meteoritics,* to both members and non-members of the Meteoritical Society, is $4.00 (or, to student members, $2.00), regardless of the number of issues published. Orders for subscriptions should be sent to the Secretary of the Meteoritical Society, Dr. John A. Russell, Department of Astronomy, University of Southern California, Los Angeles 7, Calif.