tions of auxin. If, instead of a grafted scion, agar containing an auxin in physiological concentration and no scion be used in the incision, vascular strands of xylem are formed in the callus as before. Thus far, no phloem has been recognized in the experiments.

The results appear to be in accord with Jacobs' findings: the production of xylem occurs when sugar and auxin are available to the callus. The corollary seems to be in the genesis of strands of xylem in the callus wherever limitations of sugar or auxin concentration are satisfied. It may well prove to be true that the vascular cylinder in a stem forms where it does because the demands for xylem formation are better satisfied in the elongate cells of the procambium than in the shorter, more or less isodiametric cells of the neighboring cortex and pith.

Fruity Mutant of the Slime Mold *D. discoideum*: Alterations in the Normal Pattern of Cellular Differentiation

Maurice Sussman, *Northwestern University*

In *Dictyostelium discoideum* wild type, cessation of growth is attended by the appearance of initiator cells within the population of myxamoebae. Each initiator evokes the formation of a multicellular aggregate by its neighbors. The aggregate is subsequently transformed into an organized fruit with spores, stalk, and basal disk cells. Under the conditions employed for analysis, the ratio of initiator cells to responder cells (the remainder of the population) is 1: 2200. The genetic alteration in the fruity strain leads to an enormous increase in the number of initiators such that the ratio of initiators to responders is 1: 24. The examination of aggregations by mixed populations of mutant and wild type has indicated that the mutant initiators can provide stimuli affecting any responder cell whether mutant or wild type.

The multitude of initiators in the mutant stock results in the formation of aggregates containing very few cells and correspondingly tiny fruits. Some of the latter have been found to consist of as few as 12 cells and yet to retain the normal structural relationships in terms of gross proportions and cellular morphology. The pertinence of these results to the problem of regulation in morphogenetic systems is discussed.

Differential Growth of Mental Abilities

L. L. Thurstone, *University of North Carolina*

The components of human intelligence that have been isolated during the last two decades by the methods of multiple-factor analysis are called primary mental abilities. Data have been collected for a large school population for the age span 5–19. This paper reports the mental growth curves for seven of the primary mental abilities. These are perceptual speed P, number N, the first space factor S_1, verbal comprehension V, word fluency W_1, immediate memory M_1, and reasoning R.

In order to determine the shapes of the mental growth curves, it was necessary to establish a metric. This is a scaling problem that was solved some years ago. A rational origin for the scale was determined as the point on the scale at which variability at point age vanishes since the variability cannot be negative.

All the mental growth curves so far determined are S-shaped with inflection points at an early age of 3 to 7. All of them approach maturity symptotically.

The primary mental abilities mature at different ages. The perceptual speed factor P matures to ⅘ of the adult level at about age 10. The two verbal factors mature to the same level at about age 14.

It seems likely that in the future teaching methods will be adjusted to the imagery type of each child. A child's mental profile can be determined at age 5.

News and Notes

Scientific Abstracting in the U.S.S.R.

The following article, written by D. Panov, director of the Institute of Scientific Information of the Academy of Sciences of the U.S.S.R., appeared in a recent issue of Pravda. *In translation its title appears to be "Study achievements of science and technics more profoundly."*

Well-organized information, on the achievements of science within our country and outside it, is called upon to play an important role in the struggle for the further advance of science.

About 2 years ago there was set up in the Academy of Sciences of the U.S.S.R. an Institute of Scientific Information, which pursues the aim of keeping Soviet scientists and industrial and agricultural workers permanently acquainted with the achievements of science and technics throughout the world.

In order to give Soviet readers the chance of acquainting themselves with the colossal amount of new material that is continually appearing in thousands of journals published in all the languages of the world (in the sphere of chemistry alone there are published yearly about 70,000 new articles, books, and patents), great preparational work is necessary.

The Institute of Scientific Information of the Academy of Sciences of the U.S.S.R. publishes regularly so-called "journals of abstracts" on mathematics, mechanics, astronomy and geodesy, physics, chemistry, and biology, which are, as it were, a key to world literature in the respective branches of science.

A tremendous number of journals, scientific works, books, and other literature are examined regularly in order to obtain the necessary material. In 1954, 6892 foreign and 998 Soviet periodicals were subjected to this examination.

The journals of abstracts enable readers to acquaint themselves in Russian with material published in scientific and technical journals that come out even in the most distant parts of the globe and in the most difficult languages. The summaries, besides a bibliographical description, contain a complete outline of

the articles with all their basic factual data. Moreover, it is possible to order at the Institute photo-copies of those articles of which summaries have been published. This provides scientific workers in all regions of the country with the opportunity of having the material they require from scientific literature at their disposal.

Naturally, great attention is given to the works of the scientists of the Soviet Union, the Chinese People's Republic, and scientists of all the countries of people's democracy. Their works are reflected more completely here than in the journals of abstracts published abroad.

The Soviet journals of abstracts that have been published so far are devoted to the exact and natural sciences. Journals of abstracts on technics have not yet begun to appear. Preparation is going on at present for the publication of the journals *Machine-Building* and *Electrotechnics,* including automatic machinery. They will begin to appear in the second half of this year.

Technical workers, however, will find much that they require in the journals that are already coming out. The journals of abstracts on science strive to provide material of an applied nature, of interest to designers, works laboratory assistants, and senior technical personnel at factories and works.

In the journal *Mathematics,* devoted, it would seem, to one of the most abstract sciences, there is a special section on the use of theoretical-probability methods, in particular on the theory of statistical control, which is of great importance in mass production. In this same journal there are detailed reports of the works of one of the most rapidly developing branches of science at the present time—the field of calculating machinery and its use. In the issues of *Mathematics* that have appeared, information has been published on more than 40 new types of electronic calculating machines, designed and built recently in the United States of America, Britain, France, and other countries. The majority of these modern machines calculate at high speeds. They carry out from 10,000 to 20,000 additions a second.

In this same section there is information on the new small-scale electronic calculating machine that can be installed in aircraft and used, for example, for navigation. This machine operates with data coming in from other instruments. It measures the indices of the instruments 10 times a second and produces the results of the calculation at the same rate.

In other summaries light is thrown on questions of using electronic calculating devices in controlling machinery automatically according to a complex program worked out in advance, and questions of new technology are examined, in particular that of the mass manufacture of electronic apparatus.

In the journal *Physics* there are discussions of the practical application of physics, geophysics, and meteorology. Many summaries are published on the use in technics of methods of marked atoms and supersonic sound, including supersonic sound in cleaning fur from the inside of boilers, supersonic welding of aluminum and iron, and so on. This journal published data on, for example, such new instruments as the portable "Geophone" transmitter for underground communication in mines.

In the journal *Mechanics* questions of prime importance for engineering are regularly dealt with. Readers will find there summaries on the latest designs of gas turbine engines, new types of testing machinery, the mechanical properties of a great variety of materials from heat-resistant alloys to textile fibers.

The journal *Chemistry* gives summaries in all the branches of this science In it the problems of chemical technology and other problems of importance to the chemical industry are dealt with. One can read in this journal of the new method of obtaining highly durable pig iron by blowing it with argon, of an automatic plant for turning out steel wheels for trucks by casting them under pressure in graphite molds, and of a new process for making cellulose that enables the productivity of the plants to be increased 1½ times.

The journals *Biology* and *Biochemistry* publish material that is of value, not only to the biologists, but also to medical and agricultural workers.

The publication of journals of abstracts is something new, and for this reason their work suffers from a number of shortcomings. Thus, insufficient light is thrown on patent literature, and the summaries are sometimes published after considerable delay.

This year there will come out subject, formula, and other indexes to the journals of abstracts which will make reference to the necessary material much easier. The journal containing the indexes will serve as a permanent reference book for the given science over the appropriate period of time.

The publication of Soviet journals of abstracts is a great event in the scientific life of our country. It is necessary that their readers—members of scientific institutions and academic establishments, workers of industry and agriculture—should take into account in their scientific and practical activity the relevant achievements of modern homeland and world science and technics. It is important that the journals of abstracts should find their way into every library, into every scientific institute and higher educational establishment and should reach every scientific worker, engineer, and student.

Science News

Under a recent reorganization announced by Dean Rusk, president of the **Rockefeller Foundation,** the total activities of the foundation in all fields of science have been brought into closer interrelationship. Warren Weaver, for more than 20 years the director for natural sciences, has been made vice president for the natural and medical sciences; in that position it will be his responsibility to develop, coordinate, and supervise all of the foundation's activities in science. Associated with Weaver will be three directors: J. F. Harrar, director for agriculture; Robert S. Morison, director for biological and medical research; and

John C. Bugher, director for medical education and public health. Harrar and Morison have for some time been active members of the foundation staff. Bugher originally joined the staff in 1937, and has for the past 4 years been on leave of absence to serve as director of the division of biology and medicine of the U.S. Atomic Energy Commission.

The terminology of the new positions reflects the fact that for many years the primary emphasis in the Rockefeller Foundation's program in the natural sciences has been upon modern experimental biology. But this by no means indicates a lack of interest in the mathematical and physical sciences. On the contrary, a special feature of the biological program has been a concern to aid in the application of mathematics, physics, and chemistry to basic biological problems; and occasional grants, strictly in the physical sciences, have also been made from time to time. This continuing interest in the physical sciences will be a special concern of Weaver, whose own training was in mathematics and physics.

Alan Gregg continues as vice president on special assignments; and Lindsley F. Kimball, a vice president since 1949, becomes executive vice president. Norman S. Buchanan returns to the foundation in July as director for social sciences, succeeding Joseph H. Willits, who retired in 1954. Buchanan was associate director for social sciences from 1947 to 1950. He is at present professor of economics at the University of California. Charles B. Fahs remains as director in charge of the humanities program, in which capacity he has served since 1950.

Rusk also announced the retirement of Andrew J. Warren and paid high tribute to his 34 years with the foundation that culminated in his service as director of the former division of medicine and public health. "Dr. Warren has performed distinguished service in almost every continent and made a notable contribution to the fight against yellow fever and in the development of improved public health in many countries. He will be sorely missed by his colleagues in the Foundation."

France is now constructing a **nuclear center at a Rhône River town** called Marcoule, and according to a 5-year plan announced recently by Francis Perrin, high commissioner for atomic energy, the country will have its first atomic factory at the end of 1957.

The most extensive **cloud-seeding experiment** ever attempted was conducted along the eastern coast of the United States for 9 mo during 1953 and 1954, according to Jerome Spar, New York University meteorologist who directed the study. The experiment, called "Project Scud," was organized, designed, and analyzed by the research division of the N.Y.U. College of Engineering under sponsorship of the Office of Naval Research. Information on the project was classified until recently.

From Jan. 1953 to Apr. 1953, and from Dec. 1953 to Apr. 1954, aircraft dropped 30 tons of dry ice between Florida and Massachusetts. In addition, 250 lb of silver iodide in solution were sprayed aloft from 17 generating stations from Florida to New York. The purpose of the project was to test the theory that artificial cloud seeding could modify developing storms by increasing or decreasing their intensity or by changing their direction. The answer, according to Spar, is that there is "No evidence of any large-scale meteorological effects due to seeding . . . the most careful statistical evaluation lent no support to the theory that seeding can make, break, or change a storm in a big way."

Over the 2-year period, the N.Y.U. meteorology group—which at one time numbered 25—selected 37 meteorological situations. In 18 cases, seeding was done; in 19 cases there was no seeding. The 19 nonseeding cases were control situations. Seeding and nonseeding situations were paired, and until the missions were completed the investigators did not know which situation in a given pair was the seeded one. The selections of situations for seeding were made by chance at the ONR project office in Norfolk, Va.

During the two seeding seasons, N.Y.U. meteorologists manned a weather station on the campus on a 24-hr basis. When an appropriate meteorological situation was forecast, they telephoned Norfolk at least 10 hr in advance of a suitable "zero hour," the time when planes would begin dropping their dry-ice load and the 17 ground generators would be ignited simultaneously.

In the first winter's seeding flights, three planes flew parallel 1000-mi tracks, 100 mi apart. In nonseeding cases, only one plane flew, not dropping dry ice but making meteorological observations for comparison with data obtained during the seeded situation. During the second season, planes flew in up-and-down target areas approximately 500 mi long.

The pairing system and the conduct of the experiment over two winters insured that results would not be affected by freak weather. The winter of 1952–53 proved to be one of the wettest on record, but there was no evidence of a connection between that fact and the seeding project. The negative finding of Project Scud, Spar pointed out, does not discount local effects of cloud-seeding; the experiment was designed only to examine possible large-scale effects.

The Department of Defense on 1 Apr. announced an important **change in the loyalty oath** required of college students enrolled in the basic course of the Reserve Officers Training Program. An oath—in such form as prescribed by the Secretary of Defense—was required by a rider to the Defense Department Appropriation Bill passed in 1954. The new oath is:

> I do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign or domestic; that I will bear true faith and allegiance to the same; and that I take this obligation freely, without any mental reservation or purpose of evasion; so help me God.

This oath replaces a much longer and more detailed one in which the student was required to make a

declaration concerning his standards of conduct and his membership in, association with, or attendance at meetings of organizations on the "Attorney General's List."

Waldo L. Schmitt, head curator of zoology, U.S. National Museum, is directing an expedition sponsored by the Smithsonian Institution that is to spend between 2 and 3 mo investigating the invertebrate fauna of **the Belgian Congo,** with special emphasis on the mites and ticks, as well as their plant and animal hosts. The crustacean fisheries operated by the natives in the extensive Congo River sytsem and tributaries will also be studied.

The party includes Edward Baker of the Entomology Research Branch of the U.S. Department of Agriculture, who is particularly interested in the mites of importance or potential importance to agriculture in the United States, and Roy Lyman Sexton of Washington, D.C., a medical consultant who has previously conducted surveys for the Government on the health of native populations. His son, Roy L. Sexton, Jr., chief of the photolaboratory at Walter Reed Medical Center, has been lent to the expedition as microphotographic specialist. The group entered the Congo at Leopoldville on 10 Apr. and is proceeding by automobile across country from west to east in order to go down the Nile to Cairo before returning to Washington.

The U.S. Navy announced on 10 Apr. that an experimental **one-man wingless platform** has made short successful flights. A circular machine approximately the width of a man, it is held in the air by a set of counter-rotating propellers on the underside that suck air through holes in the platform. Designed and built by Hiller Helicopters, Palo Alto, Calif., it has not flown more than a few feet from the ground. It is stabilized and controlled by the same instinctive reactions a person uses to stand upright—the pilot just leans in the direction he wants to go.

The craft is covered at the side with a circular casing to provide protection from the propeller blades, and it is supported by four spherical legs. The pilot stands inside a ring of metal about as high as his waist. Two separate engines, which together develop less than 100 hp, turn the propellers.

On 13 Apr., Sen. Frederick G. Payne (R, Me.) introduced in the Congress a resolution (S. Con. Res. 22) concerning the **effects of radiation.** The final paragraph reads:

> *Be it resolved by the Senate (the House of Representatives concurring)*, That the Congress requests the President to instruct our chief delegate to the United Nations to take whatever steps may be necessary to propose and urge the formation of an international scientific commission within the United Nations to study and determine the effects on living organisms of radioactivity released by nuclear explosions.

A statement by the Federation of American Scientists endorsing the resolution points out that the plan to appraise radiation effects announced on 8 Apr. by the National Academy of Sciences [*Science* **121,** 543 (15 Apr. 1955)] would provide a reliable technical evaluation of the problem. The FAS believes, however, that worldwide acceptance of such an evaluation is most likely to be accorded the findings of a U.N. commission such as that proposed by Sen. Payne.

A survey of the January graduating class at Illinois Institute of Technology shows that these **engineers** received an **average starting salary of $383** per month, an all-time high and $10 more than a year ago. Some 200 companies sent representatives to interview the graduates, and each was interviewed by an average of seven companies.

Chemical engineers received an average starting salary of $398, a $4 increase over January 1954, and in mechanical engineering salaries jumped from $370 to $392 per month. Starting pay for electrical engineers went from $367 to $386, and for industrial engineers from $350 to $353. The only decline was in civil engineering, where there was a drop from $388 in January 1954 to $378 this year.

Scientists in the News

The Quartermaster Research and Development Center of Natick, Mass., has announced two appointments. **Harold J. Hoge,** who was formerly associated with the research department of Leeds and Northrup Co., Philadelphia, Pa., has been made chief of the physics branch of the Pioneering Research Division; and **Dwight Williams,** former section research director for the Westvaco Chlor-Alkali Division of the Food Machinery and Chemical Corp., South Charles, W. Va., has been named chief of the biology and chemistry branch of the Chemicals and Plastics Division.

The following awards were presented during the recent meeting of the International Association for Dental Research in Chicago. The Souder award, conferred this year for the first time, was given to **Richard L. Coleman,** director of research for the J. M. Ney Co. of Hartford, Conn., in recognition of his contributions in the field of research and development of dental materials. The award was established in honor of **Wilmer Souder** in recognition of his pioneering efforts and outstanding accomplishments in dental materials research. Souder retired in 1954 as consultant for the National Bureau of Standards after more than 30 yr of service. He developed the Bureau's dental research laboratory and he has contributed extensively to the fields of dental materials, applied physics, and criminology.

The association's Novice award was presented jointly this year to **D. E. Waite** and **C. E. Staley** of the University of Iowa for their paper entitled "Pulpal changes resulting from freezing storage technics." This $100 prize is given for the outstanding research report among those submitted by individuals who have never before presented a paper at a meet-

ing of a national scientific group or published a scientific paper in a journal that has national circulation.

Alvin Radkowsky, senior physicist for the Naval Reactors Branch of the U.S. Atomic Energy Commission, has received the Distinguished Civilian Service award for his development of a method of substantially increasing the life of nuclear reactor cores, a method that also increases safety and simplifies mechanical control problems.

For research on the photographic process, **Julian H. Webb,** associate head of the physics division at Kodak Research Laboratories, Rochester, N.Y., has been awarded the 1954 Progress medal of the Royal Photographic Society of Great Britain. He was cited for his "important series of studies of the photographic process extending over many years." These studies deal with the fundamental theory of photographic exposure and the structure of the latent image. Webb was the first to apply quantum mechanical principles to the action of light on crystals of light-sensitive silver salts. In addition, his investigations have covered the effects of light exposure on photographic materials at varying light intensities and different temperatures. He is also credited with research on the relationship between the sensitivity properties of single grains and the characteristic curve of photographic materials.

T. G. Blocker, Jr., professor of plastic and maxillofacial surgery at the University of Texas Medical Branch, Galveston, has resigned his position as dean of the medical faculty. Blocker is expanding the research program in plastic surgery at the John Sealy Hospital.

Daniel M. Green, formerly associate clinical professor at the University of Southern California School of Medicine and director of the hypertension clinic for the Los Angeles County General Hospital, has been appointed director of research for the Nepera Chemical Co., Yonkers, N.Y. Two senior biologists, both from the University of Montreal, have also joined the firm's technical staff: **Réné Girerd** of Dijon, France, who has been serving as a research assistant under Hans Selye, and **Ernesto Salgado** of Madrid, Spain, a research associate who has published clinical papers on hypertension and other subjects.

Heinz Hopf, head of the mathematics department at the Swiss Federal Institute of Technology in Zurich, and president of the International Mathematical Union, was the recipient of an unusual honor on the occasion of his 60th birthday last December. Each of the 13 papers in volumes 28 and 29 of *Commentarii Mathematici Helvetici* was dedicated to him with the personal greetings of the author. His birthday was also celebrated at a reception which was attended by some 60 friends. Hopf was visiting professor of mathematics at Princeton in the fall term, 1950–51.

Eric K. Rideal, Kings College, London, was chairman of the symposium on "Molecular structures and interactions at surfaces" that was held at the Polytechnic Institute of Brooklyn on 23 Apr.

Albert F. Siepert, executive officer of the National Institutes of Health, Bethesda, Md., recently received the Distinguished Service Medal for outstanding accomplishments in research administration. The presentation was made by Oveta Culp Hobby, Secretary of the U.S. Department of Health, Education, and Welfare, at a ceremony that also honored three other NIH employees with Superior Service awards: **W. F. von Oettingen,** National Institute of Arthritis and Metabolic Diseases, for outstanding contributions to the fields of toxicology, industrial hygiene, and public health; **Frank J. McClure,** National Institute of Dental Research, for contributions to nutrition and public health dentistry; and **Bruce P. Phillips,** National Microbiological Institute, for work with the parasite *Endamoeba histolytica* through the use of germ-free animals.

Werner Braun, medical bacteriologist and chief of the variation branch of the Chemical Corps Bacteriological Laboratories at Camp Detrick, Md., has been appointed professor of microbiology and member of the Rutgers Institute of Microbiology.

Victor H. Cahalane, chief of the Wild Life Division of the U.S. National Park Service, has been named assistant director of the New York State Museum at Albany, effective 1 May. He succeeds **Alvin G. Whitney,** who has retired.

Hendrik de Wet Erasmus of the Electro Metallurgical Co., Niagara Falls, N.Y., whose research in chemical engineering has helped to clarify the chemistry of carbon and silicon, has won the 1955 Jacob F. Schoellkopf medal of the American Chemical Society's Western New York Section. The medal will be presented at a meeting of the section in Niagara Falls on 17 May.

Erasmus, head of the company's metals research laboratories, was cited for his contributions to metallurgy and industrial chemistry, particularly his development of a technique for using extremely high vacuum in the separation of carbon and sulfur from other elements. Iron alloys of unusually low carbon content are possible as a result of this work.

Donald E. Gregg of the Army Medical Service Graduate School's department of cardiorespiratory diseases, Walter Reed Army Medical Center, Washington, D.C., presented the main lecture for the Deutsche Gesellschaft für Kreislaufforschung at Bad Nauheim, Germany, on 15 Apr. He is also lecturing and giving seminars in Belgium, Sweden, and Switzerland.

Theos J. Thompson, who has been in charge of the design and construction of the Omega West Reactor that is being built at the Los Alamos Scientific Laboratory in New Mexico, has been appointed associate professor of nuclear engineering in the department of chemical engineering at Massachusetts Institute of

Technology. He will play a leading role in M.I.T.'s work in nuclear technology, and his immediate assignment will be as director of the institute's project for construction of New England's first privately-owned nuclear reactor.

Necrology

Ubaldo L. Bizzarri, 52, associate professor of pediatrics at the New York Medical College, New York, 4 Apr.; **Harry E. Crum,** 62, assistant chief geologist of the Columbian Carbon Co., New York, 1 Apr.; **Stanford C. Hooper,** 70, investigator in radio electronics, former director of Naval Communications, former chairman of the Naval Research Commission, Miami, Fla., 6 Apr.; **John B. Klumpp,** consulting gas engineer, Philadelphia, Pa., 29 Mar.; **Henry Landesman,** 65, electrical engineer, author, Morris Plains, N.J., 5 Apr.; **Leo B. Norris,** 62, former associate professor of Physiology and professor of physical diagnosis at Georgetown University Medical School, Washington, D.C., 29 Mar.; **William H. Ordway,** 66, tuberculosis specialist, Longmeadow, Mass., 1 Apr.

George H. Parker, 90, experimental zoologist, author, emeritus professor of zoology at Harvard University, retired director of the Harvard Zoological Laboratories, Cambridge, Mass., 26 Mar.; **Kaufman Schlivek,** 74, former clinical professor of ophthalmology at the College of Physicians and Surgeons, Columbia University, New York, 31 Mar.; **Edgar A. Singer, Jr.,** 81, psychologist, author, emeritus professor of philosophy at the University of Pennsylvania, Philadelphia, 3 Apr.; **Donald Y. Solandt,** 48, head of the University of Toronto's department of physiological hygiene, Toronto, Canada, 30 Mar.; **Israel Strauss,** 81, neuropsychiatrist, author, former instructor in histology at Cornell Medical School, New York, 4 Apr.; **John Treacy,** 30, assistant professor of chemical engineering at the University of Notre Dame, South Bend, Ind., 31 Mar.; **Francis J. Williams,** 47, former assistant professor of ceramics at Pennsylvania State University, director of Research and Development Laboratories, Baroid Division, National Lead Co., Houston, Tex., 19 Mar.

Meetings

The 5th **Weather Radar Conference** and 139th national meeting of the **American Meteorological Society** will be held under the auspices of the U.S. Army Signal Corps, Signal Corps Engineering Laboratories, Fort Monmouth, N.J., at the Berkeley Carteret Hotel, Asbury Park, N.J., 13–15 Sept. The program will be sponsored jointly by the Signal Corps Engineering Laboratories and the American Meteorological Society. Sessions are being planned on (i) recent developments in electronic meteorological instrumentation; (ii) techniques for the use of radar and sferics data in synoptic analysis and forecasting, including hurricane applications; (iii) techniques for the use of radar and sferics data in short range forecasting including severe weather forecasting; (iv) precipitation physics and storm structure; (v) atmospheric inhomogeneities, meteorological observations and information theoretical aspects of meteorology; and (vi) reports on operational experiences with weather radar and sferics equipments.

Titles and abstracts not exceeding 100 words in length *should be sent by 1 May* to the Director, Evans Signal Laboratory, Belmar, N.J., Attn: Local Conference Committee. Abstracts should be accompanied by an estimate of presentation time and a list of required visual aids.

A **North Central Conference on Biology Teaching,** sponsored by the National Association of Biology Teachers on a grant from the National Science Foundation, will be held at the University of Michigan Biological Station at Douglas Lake, Cheboygan, Mich., 19–30 Aug. Ninety delegates will be selected from high schools, colleges, and state departments of education in Michigan, Ohio, West Virginia, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, and Kansas.

The staff selected for the conference includes Richard L. Weaver as director, John Breukelman as chairman of the steering committee, Richard R. Armacost, Paul Klinge, and Alfred H. Stockard.

The newly constructed Medical Science Building of **New York University–Bellevue Medical Center** will be formally dedicated on 2 June. Winthrop Rockefeller, honorary trustee of the Medical Center, will preside over the ceremonies, during which honorary degrees of doctor of science will be presented to Adlai Stevenson, principal speaker of the occasion, and 12 outstanding scientists representing the United States, Canada, South America, and Europe.

The objective of Columbia University's 6th annual **Conference on Industrial Research** is to explore the human relations aspect of industrial research. This theme was chosen in response to the suggestions of participants in last year's conference and as the result of replies to inquiries submitted to many researchers as to what they felt was the most pressing problem of the day. It was also chosen because the 2nd research conference was largely on the same subject, and it was felt that a periodic review, particularly the changes that occur in a 5-year period, is important. This conference will consider the research personality, the development and training of the research worker, and the rewards peculiar to his work. The objective will be to establish the place of research in industrial enterprise. While human relations are the primary consideration, several sessions will be devoted to certain unique techniques of problem-solving.

The conference will be held at Arden House on the university's Harriman campus. Ample time will be provided for clinic and panel sessions, and the emphasis will be placed on the resolution of specific problems brought to the conference by the participants. Registration is by advance reservation only.

The fee is $300, which includes meals, lodging, reference material, and the full use of recreation facilities at Arden House. *The closing date for enrollment is 1 May.* Cancellations will be accepted up to 1 June. Inquiries may be addressed to Prof. Robert T. Livingston, Director, Industrial Research Conference, 409 Engineering, Columbia University, New York 27.

The 79th annual meeting of the **American Association on Mental Deficiency** will be held 24–28 May at the Hotel Statler in Detroit, Mich. Interested neurologists, psychiatrists, pediatricians, psychologists, social workers, educators, and parents are cordially invited to attend. Further information may be obtained from Paul Voelker, Director of Special Education, Detroit Public Schools, 453 Stimson, Detroit.

The 20th **International Physiological Congress** organized by the Belgian Society of Physiology under the auspices of the International Union of Physiological Sciences, will take place from 30 July to 4 Aug. 1956 in Brussels, Belgium. An International Meeting of Pharmacology will be held during the congress. For information write the secretary of the organizing committee, Prof. J. J. Reuse, Faculté de Médecine, 115 Boulevard de Waterloo, Brussels, Belgium.

The 1955 **conference on religion in the age of science** will take place 30 July–6 Aug. on Star Island, Isles of Shoals, off Portsmouth, N.H. More than half of last year's speakers will participate [*Science* **119**, 683 (14 May 1954); **120**, 522 (1 Oct. 1954)], together with a number of new scientific and theological contributors, who will attempt to synthesize new structures of belief about man and his relationship to the source of his being.

Among the new leaders are Alfred E. Emerson, zoologist of the University of Chicago, who has developed highly significant concepts about man's ideas of right and wrong in the light of evolution; Henry Alexander Murray, Harvard psychologist, who relates scientific concepts for the handling of the conscious and unconscious tensions between man and his environmental press to religion; and Henry Nelson Wieman, emeritus professor of the philosophy of religion of the University of Chicago, who has pioneered in the merging of scientific concepts with a concept of the source of human good in a reformed statement of theology.

It may again be necessary to turn away registrants because of limited capacity. Persons seriously interested in participating are urged therefore to register as early as possible. For information, write to the conference registrar, Mrs. Rosalind Holt, Box 156, Pennington, N.J. After June 23 address her at Hotel Oceanic, Isles of Shoals, Portsmouth, N.H.

The 31st annual meeting of the **Pennsylvania Academy of Science** took place in Philadelphia, 8–9 Apr. Sessions of the Senior Academy were held at the Academy of Natural Sciences and those of the Junior Academy at the neighboring Franklin Institute. Attending were approximately 300 scientists and students from all parts of Pennsylvania and neighboring states; they heard more than 50 papers in all branches of science.

Two $150 Darbaker prizes for papers on a biological subject were awarded in the Senior Academy: Elmer C. Herber of Dickinson College was honored for his work on the "Life history studies on *Notocotylus urbanensis,* an intestinal parasite of the muskrat"; and Ralph Wichterman of Temple University was recognized for his paper on "The usefulness of the one-celled animal paramecium in studying the effects of high-dosage x-radiation." Some 20 papers were presented during the sessions of the Junior Academy, composed of high-school students from all parts of the state, and four prizes and four honorable mentions were awarded.

The **Pacific Division of the AAAS** will hold its 36th annual meeting 20–25 June at California Institute of Technology. This meeting is expected to be one of the largest ever held in Pasadena, and representatives of 25 societies affiliated with the AAAS will conduct programs in chemistry, physics, geology, biology, astronomy, psychology, botany, physiology, and zoology. Among the special events scheduled are an address on "The support of ideas" by Dean Rusk, president of the Rockefeller Foundation, and a lecture sponsored by Sigma Xi that will be delivered by Linus Pauling, Nobel laureate and chairman of C.I.T.'s division of chemistry and chemical engineering.

The registration fee of $1 entitles a visitor to receive a final program and to attend all scientific sessions and exhibits. Because there are already indications that it may be necessary to arrange for additional hotel accommodations, interested persons are urged to communicate promptly with the chairman of the general committee, Arthur W. Galston, Division of Biology, California Institute of Technology, Pasadena.

The **American Nuclear Society,** an organization composed of some 400 scientists and engineers engaged full-time in industrial, governmental, and educational aspects of atomic energy activity, has announced plans for its first annual meeting, which will be held 27–29 June at Pennsylvania State University. The meeting will be representative of all major interests in peacetime atomic energy, according to program chairman J. A. Lane of Oak Ridge National Laboratory.

Included will be papers on fast reactor technology, experimental nuclear techniques, radiation effects on biological and physical systems, sources and economics of reactor materials, and nuclear chemical problems. The conference has been specifically designed to appeal to engineers, physicists, chemists, life scientists, and metallurgists. Papers presented will deal with data not previously published in the nonsecret literature of the atomic energy field. Five symposiums have been organized, and at the banquest on 28 June the first elected officers will be installed.

The meeting, which is similar in concept to the International Conference on the Peaceful Uses of Atomic Energy that is to take place in Geneva next August, will be open to nonmembers of the society. Information may be obtained from Prof. W. W. Miller, Pennsylvania State University, University Park, Pa.

The 2nd **International Conference on Biochemical Problems of Lipids** will take place at the University of Ghent, Belgium, 27–30 July, immediately preceding the 3rd International Congress of Biochemistry at Brussels. Provisionally the program is divided as follows: physical and chemical properties; structure; methods of separation; metabolism and biosynthesis; enzyme systems; phospholipids and transport; and miscellaneous biochemical problems. Information and application forms may be obtained from the secretary of the organizing committee, Dr. P. De Moerloose, St. Jansvest 12, Ghent, Belgium.

The 6th annual **Engineering Conference** was held at Virginia Polytechnic Institute, 21–23 Apr., on the theme of "World progress through engineering." H. A. Meyerhoff, executive director, Scientific Manpower Commission, Washington, D.C., delivered the convocation talk. This conference is sponsored by the Association for the Advancement of Engineering, a student organization, in cooperation with V.P.I.'s School of Engineering and Architecture.

Thirty technical and professional men from various industries participated in the symposiums, and an equal number of industrial exhibits was displayed. The G.E. House of Magic, which was of special interest to participants in the high-school science fair, was scheduled for 2 days of the conference. More than 600 persons in industry received invitations to attend the meeting.

Society Elections

Society of American Foresters: pres., E. L. Demmon, Southeastern Forest Experiment Station, Asheville, N.C.; v. pres., DeWitt Nelson, Department of Natural Resources, Sacramento, Calif.; exec. sec., Henry Clepper, Mills Bldg., 17th St., at Pennsylvania Ave. NW, Washington 6, D.C. Representatives to the AAAS Council are Robert P. Holdsworth and Stephen N. Wyckoff.

American Psychoanalytic Association: pres., Maxwell Gitelson, Chicago; pres. elect, William G. Barrett, San Mateo, Calif.; sec., Douglas D. Bond, University Hospitals, Cleveland 6, Ohio; treas., Robert T. Morse, Washington, D.C.

National Academy of Economics and Political Science: honorary chairman, John Donaldson, George Washington University (ret.); chairman and AAAS representative, Benjamin H. Williams, Industrial College of the Armed Forces, Washington, D.C.; 1st v. chairman, Amos E. Taylor, Pan American Union, Washington; 2nd v. chairman, Ernest S. Griffith, Library of Congress, Washington; exec. sec., Donald P. Ray, George Washington University, Washington; treas., Bruce Baird, National Savings and Trust Co., Washington; asst. treas., Herbert B. Lord, National Savings and Trust Co.; general counsel, Walter H. E. Jaeger, Georgetown University, Washington.

American Fern Society, Inc.: pres., Ralph C. Benedict, Brooklyn, N.Y.; v. pres., Dwight M. Moore, Fayetteville, Ark.; sec., Mildred E. Faust, 501 University Place, Syracuse 10, N.Y.; treas., Ronald L. McGregor, Lawrence, Kans.

Phi Sigma Society: pres., Karl F. Lagler, University of Michigan; v. pres., Samuel L. Meyer, Florida State University, Tallahassee; exec. sec.-treas., Fred S. Orcutt, Virginia Polytechnic Institute; editor, **A. M.** Keefe, St. Norbert College, West De Pere, Wis.

Grants, Fellowships, and Awards

Grants-in-aid of research amounting to $15,874 were awarded by the **American Academy of Arts and Sciences** at its March meeting. Sixteen grants totalling $12,624 were made on recommendation of the Committee on the Permanent Science Fund. Fields covered included acoustics, biochemistry, botany, ecology, entomology, paleontology, parasitology, and sociology. One of these awards was from the Academy Research Grants in New England of the AAAS. Three grants totaling $3250 were made from the Rumford Fund to support investigations in heat and light.

Twenty-seven American biochemists have received grants to assist their travel to the 3rd **International Congress of Biochemistry** to be held in Brussels, Belgium, 1–6 Aug. Eighteen of the awards were made by the National Science Foundation, seven by the American Society of Biological Chemists, and two by the Division of Biological Chemistry of the American Chemical Society. These last were given as memorials to the late Dr. Erwin Brand.

The three organizations awarded their grants as a collaborative enterprise. All the arrangements for receipt of applications and selection of grantees were conducted jointly. All the awards were made to persons selected from a group of 188 applicants on the basis of recommendations from a committee of American biochemists appointed by the two biochemical societies.

Four **RCA predoctoral fellowships in electronics** have been awarded for 1955–56 by the National Academy of Sciences–National Research Council. These fellowships, supported by the Radio Corporation of America, are designed to give special graduate training and experience to young men and women of promise in the general field of electronics.

Candidates must have demonstrated ability and aptitude for advanced work and must have had training in electronics equivalent to that represented by 1 year of study beyond the bachelor's degree in a university of recognized merit. These fellowships, which are re-

stricted to citizens of the United States, are awarded only for study and research in this country.

Research grants totaling $14,000 to three institutions have been announced by the **Upjohn Co.**, Kalamazoo, Mich. The three awards were for work on the nucleic acid metabolism of virus infected cells, endocrinology research, and for studies on the synthesis of condensed ring systems.

In the Laboratories

Managers have been appointed for two newly formed research sections at the **General Electric Research Laboratory,** Schenectady, N.Y. P. E. Pashler is manager of the applied physics section, and Richard L. Shuey is manager of the information systems section; both sections are under the Electron Physics Research Department.

The Atomic Energy Commission has announced approval of a study of reactor technology by the **General Dynamics Corp.** The company will investigate nuclear power equipment such as small power reactors and specially designed components of reactor systems with a view to manufacturing such products. It will also explore various problems related to the peaceful uses of nuclear energy; for instance, decontamination services, utilization of by-product radiation, instrumentation, waste disposal, and so forth. The company estimates it will spend $200,000 on the study, which will take 1 year.

General Dynamics manufactures submarines, aircraft, motors, electronic apparatus, and industrial processing equipment. It has had wide experience in uses of atomic energy for military purposes, including construction of the submarine "Nautilus."

Macalaster Bicknell Co., Inc., has announced its first major **Scientific Instrument Symposium** to be held in its plant at 243 Broadway, Cambridge, Mass., 2–4 June. The display will be open to all scientists and purchasing personnel at 10 A.M. daily. More than 20 major scientific equipment manufacturers will display and demonstrate their newest instruments.

The U.S. Atomic Energy Commission has authorized a nuclear power study by the **National Rural Electric Cooperative Association.** The association will finance the 1-year project, which will deal with the economic and engineering practicability of various atomic power reactor designs in relation to the specialized needs of the rural electric systems. This would include a study of the reactors to be constructed and operated in the AEC's 5-year research and development program, the Army Package Power Reactor, and any other experimental power reactors that may be designed or built within the AEC program of industrial participation. The AEC will make available to a limited number of cleared personnel of the association technical data on reactor development and will arrange for visits to AEC laboratories and reactor installations.

Miscellaneous

"Dates of Stonehenge" by V. Gordon Childe is the lead article in the May issue of ***The Scientific Monthly.*** Since Stonehenge is the most celebrated prehistoric monument in Europe, Childe's article is of wide interest. Other articles in this issue are "Recent biological studies on *Teredo*—a marine woodboring mollusc," Charles E. Lane; "Ages at time of first election of presidents of professional organizations," Harvey C. Lehman; "Crops, weeds, and revolution," Jack R. Harlan; "Glimpses of the human side of Sir Isaac Newton," Henry P. Macomber; and "Middle-Atlantic geographic corridors," Richmond E. Myers. In honor of the 50th anniversary of the U.S. Forest Service, a brief history and a description of its activities are presented in the "Science on the march" section. Reviews of 19 books also appear in this issue.

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, Ill.: coronene; phenyldimethyl phosphine; 2,2,6,6-tetramethyl-3,5-heptanedione; 2,4,5-trichloraniline; dibromofumaric acid; 2,6-dimethylol-1,4-dioxane; 2,5-dimethylol-1,4-dioxane; δ-valerolactone; ethylarsenic diiodide; cyclohexylcarboxaldehyde; *p*-trifluoromethylphenylacetic acid; 1-(4-chloromercuriphenylazo)-2-napthol (sulfhydryl reagent); 3-mercaptopropionic acid; tris(*p*-methoxyphenyl)carbinol; tris(*p*-nitrophenyl)methyl chloride; methylene fluorobromide; 6-methoxy tryptamine; 3,3′-dimethyl-4,4′-diamino-1,1′-dinaphthyl; nitrosyl perchlorate; nitronium fluorosulfonate.

In an effort to determine whether the monarch butterfly migrates, a Canadian museum is seeking the **help of American butterfly collectors.** F. A. Urquhart, director of Toronto's Royal Ontario Museum of Zoology and Paleontology, has written a letter to the Entomological Society of Washington, D.C., in which he explains that for the past 3 years museum workers have been attaching small gummed labels to the edge of the monarch's wing. The label informs the person finding a tagged butterfly that it should be mailed to the museum. The museum would like some help in both tagging and collecting, particularly from persons in the Washington, D.C., area.

The black-striped and orange monarch butterfly is considered by some to be the greatest wanderer in the butterfly world. It is reported to fly in large swarms from Canada to Mexico for the winter, and back again for the summer. One account of a swarm states that "in 1921 a swarm of monarchs 250 mi wide swept over Texas. It was estimated that 1,250,000 butterflies passed a given point every minute of daylight. And the flight continued for 18 days."

Erratum: In the issue of 25 March, page 433, the new book *Bibliography of Geology Theses, Colleges and Universities of the United States,* published by Petroleum Research Libraries, Denver, was incorrectly listed as available gratis. The price of the book is $8.