the Indians to adopt certain improvements in land use essential to a sound economy. These efforts were fruitless until the new practices were put into effect by an ex-rodeo rider who lived among them and whose horsemanship had invested him with great respect in the eyes of the Indians. Similarly, Mexico has some of the most enlightened forestry legislation on our continent, but it remains impotent until something can be worked out that makes sense to the Mexican in terms of his own culture. In our own highly industrialized culture all of the sound and fury over water pollution accomplished little until organized business, industry, labor, and sport sensed a common threat and began to join forces on the problem. The task still remains of awakening some thousands of municipalities to their responsibility. It is significant that Milwaukee, with its German cultural heritage, has been a pioneer in abating pollution and utilizing waste.

Many of the ecological maladjustments in our own society are urgent, costly, and aggravating in the extreme to those who sense them. It is a constant temptation to expend one's energy in condemnation and crusade and to satisfy one's instinct for moral indignation when the issue seems so clear-cut. But the constructive procedure, as in any ecological problem, is to analyze the processes with which we are dealing, determine the factors involved, and then go to work. In practice this means that conflicting interests and centers of influence must be identified. Those who represent them can often then be induced to state their respective cases and listen to one another. More frequently than not, in my experience, this leads toward constructive action. It may not come at once. Obstacles and delays are to be taken as a matter of course. Human beings are more refractory than the so-called "lower organisms," and time is less important than trend. Patience, persistence, good communication, and good nature are essential and, in the long run, most effective.

Lest it be thought that these suggestions are academic, I might explain that I have seen them used to improve ecological legislation, administration, and community action in widely separated parts of the United States during the past two decades.

For example in 1937 the farmers of Oklahoma descended upon Governor Marland demanding some kind of legisation that would enable them to combat soil erosion, which had become a prime menace to agriculture. The governor appointed a committee whose chairman was familiar with the idea of culture patterns. The American culture pattern seemed during the 1930's to be in a state of flux, with traditional responsibilities being unloaded upon, and cheerfuly assumed by, a benevolent federal government. Yet even Russia, under rigid controls, was evidence that every culture has its own momentum which has to be reckoned with. It can be guided and modified by its own mechanism, but it cannot be disregarded. And so, although the climate was favorable to radical innovations, the committee—with competent advice—drafted a law authorizing the voluntary formation of local districts with technical advice to be supplied by Washington. For this there was plenty of precedent in the American pattern.

It so happened that the governor was at loggerheads with his legislature, whose able leader viewed with a jaundiced eye anything that emanated from the office of His Excellency. The latter was in sympathy with the then national administration, while the legislature was extremely conservative, and particularly suspicious of the lavish federal expenditures being used as an antidote to hard times. A bitter fight was in prospect, but it was avoided by quiet and reasonable explanations, based strictly on the most traditional American practices and upon the firsthand knowledge that the chairman had of ecological conditions within the state.

Self-interest is a strong element in American culture, but so is self-respect. A practical politician is usually grateful for an issue that is strongly rooted in the scientific realities of the situation, provided that we translate it into terms he can understand. Businessmen are interested in the character of the communities in which they live as well as in the profits they can get there. And a satisfying community is largely the expression of sane ecological conditions. Who can better analyze and explain such conditions than the ecologist, trained as he should be to read the landscape? But he must be equipped to analyze the human community and understand the forces at work within it as well.

Once the ecologist expands his analysis of such phenomena as destruction of soil or native vegetation, or of disturbance of the hydrologic cycle so that he sees them, not in the personal terms of foolish individuals or bad laws, but rather in terms of the basic structure and values of his society, he is in a position to be highly effective. And he will be even more so as he learns to detect examples of good ecological adjustment. These are more frequent than he may have thought. For him these are as useful as an architect's drawings to a builder.

When we as a profession learn to diagnose the total landscape, not only as the basis of our culture, but as an expression of it, and to share our especial knowledge as widely as we can, we need not fear that our work will be ignored or that our efforts will be unappreciated.

There is no adequate defense, except stupidity, against the impact of a new idea.—P. W. BRIDGMAN.

News and Notes

Astronomical Highlights in 1954

The ten top astronomical highlights of 1954 picked for Science Service by Harlow Shapley of Harvard University are as follows:

1) Out of the abundance of contributions in the field of radio astronomy—from Holland, England, Australia, the United States, and Canada—especially noteworthy was the work of John D. Kraus and H. C. Ko of the College of Engineering of Ohio State University. They mapped much of the northern sky as it would be seen to an eye sensitive only to radiation of wavelength about 122 cm. The Milky Way is clearly recorded in this radiation as well as the Virgo group of galaxies, the intensely bright galactic nucleus, and some special hot spots in Centaurus, Cygnus, and especially Cassiopeia. To this radio eye, globular star clusters remain undiscovered.

2) The dedication of the new Pulkovo Observatory, near Leningrad, built on the site of war ruins, brought again into the national and international picture a large institution that a century ago was sometimes rated as the astronomical capital of the world.

3) Two large enterprises in the astronomy of position were completed. At the Lick Observatory, Director C. D. Shane, assisted by C. A. Wirtanen, completed the first series of plates for the sky-mapping program, planned many years ago by the former director, W. H. Wright; and at the University of Minnesota, W. J. Luyten finished the Bruce proper motion survey, adding 19,000 stars to his lists of those with appreciable motion—an investigation that has continued steadily for 25 yr. Some decades from now the Lick Observatory series of plates will be repeated and will then provide the best material ever assembled for the study of star motions referred to distant galaxies. Evaluation of the rotation of our galaxy is one of the goals of this long-range investigation.

4) At the Mexican National Astrophysical Observatory, Tonanzintla, Puebla, Guillermo Haro, director of the Tonanzintla and Tacubaya observatories, discovered and measured a large number of "slow-motion" flarelike stars in the nebulosities of Orion.

5) Milton Humason of Mount Wilson-Palomar Observatory completed at least one phase of his elaborate study of the radial velocities of 580 galaxies, which, when supplemented by N. U. Mayall's measurements at the Lick Observatory of the red shifts of nearly 300 galaxies, will provide the basic information on the expanding universe. Humason has found 20 galaxies with velocities in excess of 25,000 km/sec, with the greatest speeds slightly exceeding 60,000 km/sec.

6) New and highly promising developments were reported in the utilization of solar energy, including (i) the large-scale production of solar cookers in India, (ii) a practical solar cooker developed in California that can attain a temperature under best conditions of 8500°F (not much less than the temperature of the solar surface), and (iii) some partially revealed developments in the Bell Telephone Laboratories and the Wright Air Development Center that involve cells and batteries that absorb the solar radiation and make it efficiently available for heating.

7) The production of a color-magnitude array for the globular cluster Messier 3, reaching down for the first time to stars of smaller luminous intensity than that of the sun, was accomplished by H. C. Arp and A. R. Sandage with the Hale telescope on Mount Palomar.

8) A new and appealing proposal was advanced by Dean B. McLaughlin of the University of Michigan to account for the markings on Mars. They can be reasonably explained as analogs to the dust bowls of the Southwest. The "trade winds" on Mars (where the absence of oceans and of long mountain ranges permits them to behave otherwise than with us) pile up, in drifts and ridges, the sand, dust, and volcanic ash, some of which, because of the lack of oxygen in the Martian atmosphere, can have a greenish tone. Thus, both the canals and the life on Mars are disposed of as largely illusions produced by Martian meteorology. To provide the drift material, active volcanoes are required. Only an astronomer competent in geology and meteorology could have originated the theory.

9) Although only preliminary results have been reported, the wide atack on the total solar eclipse of June was noteworthy, and especially so was the 10-station program of the U.S. Air Force, which distributed observers all the way from Ontario through Labrador, Greenland, and Scandinavia to Iran.

10) An extensive and very valuable program of support for astronomical research was followed by the National Science Foundation, and considerable assistance was given to pure astronomical investigations by the U.S. Air Force, the U.S. Navy, and the National Bureau of Standards.

In summary, the past year has been noteworthy for interesting contributions all the way from the heart of classical astronomy to the astronomical borders where the scientists of other fields, such as radio and engineering, contribute importantly to our knowledge of stars, galaxies, interstellar dust, and the solar system.

Marine Biology in Latin America

A group of Latin American specialists in marine biology met in Concepción, Chile, 15–17 Sept., to study the possibility of establishing an international network of marine biological laboratories in Latin America and to consider other ways of facilitating collaboration in this field among the Latin American countries. The meeting was convoked by the UNESCO Science Cooperation Office for Latin America and was a follow-up on recommendations made by a previous UNESCO meeting on international laboratories held in Montevideo in 1952. The scientists attending the recent meeting came from Argentina, Brazil, Chile, Cuba, Mexico, Peru, Venezuela, and Uruguay. The FAO Regional Office in Santiago collaborated actively in the organization of the meeting.

After studying the current status and potential of marine biological research in Latin America, the delegates discussed extensively the establishment of the international network of laboratories. It was unanimously decided to create immediately, under the auspices of the UNESCO Science Cooperation Office, a Latin American Committee to coordinate and facilitate

research in marine biology. The Committee is to remain in office until a permanent organization has been set up. The meeting requested the UNESCO office to prepare the initial draft of a convention for the proposed group of laboratories and to call a meeting of the official delegates in order to establish the permanent organization.

The meeting also considered other immediate steps for promoting research pending realization of the more far-reaching recommendations. It was suggested that in 1955 the UNESCO office arrange two training courses on the methodology of marine biology research and a symposium on plankton. In addition it was recommended that the *Marine Biology Journal,* edited by the Montemar Station in Chile, should be converted into an international publication with an international (Latin American) editorial board.

The Brazilian representatives to the meeting, duly authorized by the governor of the state of São Paulo, informed the delegates that they would put at the disposal of the UNESCO Science Cooperation Office the marine biological laboratories, stations, and research vessels of the state of São Paulo. This offer will make possible the prompt initiation under UNESCO auspices of international research and training programs.

A. ESTABLIER, *Head*
UNESCO Science Cooperation Office
for Latin America
Montevideo, Uruguay

Science News

The editors of the *Saturday Review* asked Norbert Wiener of Massachusetts Institute of Technology to discuss the question "Does a great mathematical theorist—or a genius like Mozart—spring out of nowhere, or is there some way society can help? Education?" In his response, **"Science, Monkeys, and Mozart,"** which appears in the 20 Nov. issue of the *Review,* Wiener makes a plea for a vigorous, free atmosphere of intellectual society and warns that the modern urge toward more size and more secrecy is endangering those traditions by which all genius is most encouraged.

> . . . The genius of Mozart and the genius of the really great mathematician, and, in particular, of that sort of mathematician who learns his trade young, are different only in direction, but not in character. . . . We may throw aside once for all the claim that, because the greatest scientists are men of genius and relatively uninfluenced by their formal education, we may conclude that scientific education is irrelevant to genius. A scientist must know what is being done in order that the very individuality of his own work may come to full fruition. He must live in a world where science is a career, where he has companions with whom to talk, and in contrast with whom he may bring out his own *sève*. . . . Thus, the universities are the mothers of science. . . . Many of today's American scientists are working in Government laboratories, where secrecy is official, and they are "protected" by the deliberate subdivision of problems to the extent that no man can be fully aware of the general bearing of his own work.
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> . . . There are scientific ideas which we can trace clearly to the time of Leibiniz, a quarter of a millennium ago, which are just beginning to find their applications in industry. Can a business firm or a Government department, moved primarily by the immediate needs for new weapons, compass this period of time in its backward glance? . . . The great grove of science must be left to long-time institutions capable of formulating and maintaining long-time values. . . .
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> One of the rare and incalculable benefits for which we must provide if the race is going to survive is the sudden emergence on the scene of great and original intellects. . . . The handling of [these] . . . must be transferred to more stable institutions which have as their task the fostering of general culture. Among these are the foundations and the universities, which at least contemplate such a continued existence.
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> The great industrial and government laboratories are important and have a real function to fulfil, but they are not enough. . . . It is popular to believe that the age of the individual and, above all, of the free individual is past in science. The example of Manhattan Project and the atomic bomb is being taken as the norm of scientific development all along the line. There are many administrators of science and a large component of the general population who believe that mass attacks ("crash-programs") can do anything, and even that ideas are obsolete.
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> . . . It is perfectly possible for the mass attack by workers of all levels from the highest to the lowest to go beyond the point of optimum performance and to lose many really good results it might obtain in an unreadable ruck of fifth-rate reports. . . . If a new Einstein theory were to come into being as a Government report in one of our super-laboratories there would be a really great chance that nobody would have the patience to go through the trash published under the same auspices to discover it.

The Weizmann Institute of Science in Rehovoth, Israel, has announced the completion of **synthesis of sphingosine** by David Shapiro of its organic chemistry department. Sphingosine is part of a group of complex compounds occuring in natural form in the spinal cord, brain, blood corpuscles, liver, spleen, and kidneys. Certain diseases cause an over-production of the sphingosine complexes in the organs involved, while a deficiency of the substance has been observed in the nerves of diabetics and arteriosclerotics. The synthesized compound can be made with radioactive isotopes of nitrogen or carbon.

Forty-one German scientists who worked on Hitler's guided-missile projects **became American citizens** on 11 Nov. All have been U.S. residents for almost 10 yr and all are employed at the Government's arsenal at Huntsville, Ala. Wernher von Braun, known for his writings on space travel, is the unofficial leader of the group.

A new concept of "**mental temperature**" may explain why some scientists are more than 100 times more productive than others, according to a report to the Operations Research Society of America by William B. Shockley, director of the Weapons Systems Evaluation Group of the Department of Defense. The basis for the report was a statistical study of production of scientists at Los Alamos Scientific Laboratory, the National Bureau of Standards, and other locations. The differences in rates of scientific production are much larger than other variations among men. No runner can race a mile 100 times faster than another, and one man does not speak 100 times faster than another, Shockley said.

The concept of mental temperature or capacity likens the production of ideas to a chemical reaction. A small increase in temperature can speed the reaction considerably. If a man's mental temperature is twice that of another, he is likely to be a hundred times more productive. Mental temperature may be related to the number of ideas a scientist can consider at one time. Small increases in this capacity may greatly increase his productivity. Shockley pointed out, however, that a study of the relationship between salary and productivity shows that to win a 10 percent raise, a research worker must increase his output between 30 and 50 percent.

A recent issue of *Modern Metals* reports the use of **portable dairy barns** by farmers in Oklahoma and Texas. Designed by the Oklahoma Agricultural Experiment Station, the barns cost $2500, can be moved by truck, and will house four cows each.

Too many H- and A-bomb explosions may create **excessive radiation** in the world's atmosphere, therefore a limitation of the number of test explosions conducted is being considered. An idea that may be practical has been put forth by Pierre Auger, French physicist and head of the natural science section of the United Nations Educational, Scientific and Cultural Organization in Paris. Auger was French delegate to the United Nations Atomic Energy Commission. He has suggested that countries might agree to limit their nuclear tests: for instance, the United States and Russia might restrict themselves to a maximum of ten annual explosions each; Britain, three; France, two.

In an article in the *Weekly Review* of the French Academy of Science another French physicist, Nobel prize winner Louis de Broglie, has listed four long-term effects of hydrogen bomb explosions. He states that "Any increase in the number of explosions will bring unpredictable changes and a growing disequilibrium of the natural conditions to which animal and plant life has slowly adapted itself."

If tests are fired repeatedly without regard to the radiation danger, we may drift into a pollution of the air that it will be impossible to remedy. Recent articles in the *New York Times* and the *Washington* (D.C.) *Post* and in many other leading publications have considered this subject with growing concern.

Radio waves at a frequency of 60 kcy/sec can be used as a standard of **time accurate to one part in a billion,** according to a report in the 20 Nov. *Nature* by J. A. Pierce of Harvard University; H. T. Mitchell of the Radio Experimental and Development Laboratory, Post Office Engineering Department, London; and L. Essen of the National Physical Laboratory, Middlesex. This is 200 times more accurate than the present system, which also depends on radio waves but those that are in the high-frequency range.

The 60-kcy/sec wave, although broadcast with only 10 kw of power from Rugby, was picked up by scientists at Harvard University. These results "are clearly of significance in problems of frequency control, international frequency and time standardization and navigational aids based on phrase comparison," and are probably of interest in a much wider field.

Speaking at a meeting of the Commercial Chemical Development Association, W. F. Mitchell of Shell Petroleum, Ltd., reported that the **production of chemicals** in the entire free world outside of North America is approximately 8 percent smaller than in the United States alone. Outside of North America and the Soviet Zone, the approximate distribution of production is 20 percent in Western Germany, 22 percent in the United Kingdom, 40 percent in other West European countries, and 18 percent in all other areas.

Since 1938 the production of chemicals in Europe, including the United Kingdom, has increased by about 80 percent, compared with about 200 percent for the United States. Since 1950, however, production in Europe has risen by almost 30 percent, compared with a 20 percent rise for the United States.

At the same meeting H. J. Taufen of the Hercules Powder Co. pointed out that foreign technical journals are often a valuable source of information, and that studying them is a necessary means of assimilating the background information, the point of view, and the mode of operation of technical people in other countries. Lack of such background can be a serious drawback in foreign transactions. Taufen also emphasized the value of patent literature as a fertile source of new ideas.

Announcement has been made that **Edward Teller,** nuclear physicist, will make his television debut over San Francisco's educational TV station in the near future. It is reported that he will deliver a series of talks on the atom.

Claiming that in 1937 she discovered a new species of actinomycetous organism which Selman A. Waksman used in the development of streptomycin following their collaboration in research work, Mary A. Marcus has filed a $5 million patent infringement **suit against Waksman.** Named codefendants with Waksman are the Rutgers Research and Endowment Foundation and Merck and Co., Inc. A similar suit, filed in 1951 against Waksman by Albert Schatz of National Agricultural College, was decided in favor of the plaintiff.

The U.S. Department of Labor bulletin, *Employment Opportunities for Women in Professional Engineering,* indicates that **women engineers** should find job prospects excellent. The bulletin estimates that there are approximately 3600 employed women engineers and some 3000 women who are engineering aides, draftsmen, and technicians. The total of 6600 accounts for about 1.2 percent of all engineering employment. Chemical engineering engages the smallest number of women engineers.

In the October *American Library Association Bulletin,* S. R. Sapirie, manager of Oak Ridge Operations, U.S. Atomic Energy Commission, describes the integrated organization of the five **Oak Ridge libraries.** He states:

> The indispensability of the library to the atomic energy program is unquestioned. . . . A standard preliminary step in the launching of a research or scientific development effort is a thorough search of books and documents in the field to be investigated. . . . The [Oak Ridge] libraries have a carefully chosen, all-useful collection of books and documents totalling in excess of 125,000.

Sapirie concludes that it is "only through the library that continued progress in nuclear science and other fields can be assured in the future. And only with suitable libraries and library service could nuclear science have reached its present stage of development."

The faculty of the University of Wisconsin recently published memorial resolutions on the deaths of three members of its department of botany: **Charles Elmer Allen, Norman Carter Fassett,** and **H. Gerhard F. Sander.** The three professors were outstanding in their respective fields: cytology, plant taxonomy, and genetics. Dr. Allen was 82 at the time of his death in June 1954 and had served on the faculty for more than 40 yr, until 1943, when he retired with emeritus status. A member of the National Academy of Sciences and the American Philosophical Society, he had held high offices in many scientific organizations; from 1918 to 1926 he was editor-in-chief of the *American Journal of Botany.* Outstanding among his many scientific accomplishments were his discovery of sex chromosomes in certain of the lower plants, his pioneer work on the study of sex inheritance in plants, and early work on chromosome morphology, numbers, and behavior. While his early endeavors were directed to purely cytological studies, much of his later work was of a genetic nature. In addition to the papers reporting his own work, Dr. Allen was coauthor of two well-known textbooks.

Dr. Fassett died in September at the age of 54. He joined Wisconsin's faculty in 1925 as an instructor in botany and in 1944 became a full professor. A forceful and stimulating personality, Dr. Fassett was noted for the excellence of his lectures; sparkling wit, dry humor, and a wealth of illustrative material characterized his delivery. He was the author of more than 100 professional papers and several books. A founder of the American Society of Plant Taxonomists, he was its president when he died. Because of his profound enthusiasm for the out-of-doors and his interest in conservation, no student ever left his classes without an increased perception of America's natural resources. During World War II he was in Colombia with the U.S. Cinchona Mission searching for new sources of the critical drug, quinine.

Dr. Sander was born and brought up in Frankfurt am Main and, at the age of 16, was already doing research in plant cytology. Although he was only 39 when he died on 23 July after difficult years of chronic illness, he had completed extensive cytological research and was planning further studies in another of his major fields of active interest, human genetics. He left Germany in 1934 to study with Leonard Huskins at McGill University, where he obtained a Ph.D. After research at McGill, the University of California (Berkeley), Harvard University, and Columbia University, he rejoined Huskins at Wisconsin as an assistant professor in 1952. Following an early interest in the cytology of *Funkia,* he conducted investigations throughout his life on the cytogenetics of wheat and oats. While at McGill he played a major role in a program covering a variety of genetical and cytological problems in mice.

William Lloyd Evans, 83, professor emeritus of the department of chemistry, Ohio State University, died on 18 Oct. in Columbus. He headed the department from 1928 to 1941. A student of J. U. Nef, Dr. Evans concentrated his main research in the alkaline reactivity of carbon compounds, especially carbohydrates. He was an outstanding teacher of freshman chemistry and an inspirational director of graduate research.

In 1929, he received the Nichols medal (N. Y. section, American Chemical Society), and in 1942 the American Institute of Chemists medal. He was elected president of the American Chemical Society in 1941.

Scientists in the News

Lionel Whitby, vice chancellor of the University of Cambridge and Regius professor of physics, will be a guest of the University of Texas Medical Branch, Galveston, on 13 Dec., for a series of conferences and seminars on blood disorders.

Lawrence R. Hafstad, director of the Reactor Development Division of the Atomic Energy Commission in Washington, has resigned, effective 1 Jan., to join the staff of the Chase National Bank as atomic energy consultant. Hafstad will represent Chase in conferring with various groups planning the development of atomic energy by private industry.

J. F. G. Clarke has been appointed curator of insects in the U.S. National Museum. For the past 7 mo, following the retirement of Edward A. Chapin, **O. L. Cartwright** has served as acting curator.

Linus Pauling of California Institute of Technology was able to go to Stockholm this month to receive the 1954 Nobel prize in chemistry. A passport has been issued that permits him and his wife to travel around the world. Pauling plans visits to India and Japan in response to invitations from fellow scientists. Last year he could not accept his invitation to India because he could not obtain State Department permission to make the trip.

Fontaine C. Armistead has been appointed director of the Virginia Institute for Scientific Research in Richmond. He has been at Massachusetts Institute of Technology for the past 7 yr as a staff member in the physics department and also as an employee there of the Texaco Development Corp. His fields of activity have been isotope separation by centrifuging, mass spectrometry, gas diffusion, vacuum engineering, and nuclear science instrumentation.

The Hoover medal "for distinguished public service" was presented to **Alfred P. Sloan, Jr.,** chairman of the board of General Motors, at the annual dinner of the American Institute of Consulting Engineers. The medal is awarded annually by a board composed of representatives of the national societies of civil, mining, mechanical, and electrical engineers. Sloan is president of the Alfred P. Sloan Foundation, which has contributed to a number of colleges and universities. The foundation made possible the Sloan-Kettering Institute for Cancer Research, a component of the Memorial Cancer Center, New York, of which Sloan is a manager.

John A. Fincher, head of the department of biology at Howard College, Birmingham, Ala., has been elected assistant to the president of the college. He will continue his duties in the biology department.

William A. Pennington, former chief metallurgist and chief chemist of the Carrier Corp., has been appointed professor in the chemical engineering department at the University of Maryland, effective 1 Dec.

Henry L. Cox, vice president in charge of the chemical division of the Corn Products Refining Co., gave the 1954 Robert Kennedy Duncan memorial lecture at Mellon Institute. He spoke on "Some aids to a scientific career." The Duncan lecture is presented annually to perpetuate the memory of the institute's first director, who originated the fellowship system of research that has been in operation there since 1913. Last year's lecturer was John C. Warner, president of Carnegie Institute of Technology.

The Columbia University School of Mines has awarded the first Ambrose Monell medal for distinguished achievement in mineral technology to **Lloyd M. Pidgeon,** of the University of Toronto. He is discoverer of the "Pidgeon Process" for production of metallic magnesium.

The $1000 Wien award for outstanding research in cancer cytology was presented to **J. Ernest Ayre** at a dinner meeting of the Southern Society of Cancer Cytology in St. Louis on 8 Nov.

Kenneth C. D. Hickman, formerly vice president in charge of research for Distillation Products Industries, and consultant to the Eastman Kodak Co., has been appointed research consultant to the Consolidated Vacuum Corp., Rochester, N.Y. He will join with the company's other research people in implementing a program aimed at developing radically new methods for producing high vacuum. Announcement of the appointment was made in conjunction with the opening of Consolidated's new plant in Rochester.

LeRoy M. Ennis, professor of oral roentgenology in the School of Dentistry and in the Graduate School of Medicine of the University of Pennsylvania, has been granted a 2-yr leave of absence to accept appointment as adviser to the Government of Egypt on dentistry and public health affairs. Last year Ennis served as a Fulbright professor in the University of Cairo, where he reorganized procedures and modernized the system of dental education.

At the recent annual meeting of the British Institution of Radio Engineers the recipients of institution premiums for papers published during 1953 received their awards. The chief honor, the Clerk Maxwell premium, was presented jointly to **W. Saraga, D. T. Hadley,** and **F. Moss** for their paper "An aerial analogue computer" that appeared in the organization's *Journal* for April 1953. Other awards were as follows:

The Heinrich Hertz premium to **B. E. Kingdon** of The Atomic Energy Research Establishment, Harwell, for his paper "A circular waveguide magic-tee and its applications to high-power microwave transmission" (published in May 1953).

The Louis Sterling premium to **D. A. Bell** of the electrical engineering department, University of Birmingham, for his paper "Economy of bandwidth in television" (published in September 1953).

The Sir J. C. Bose premium to **S. K. Chatterjee** of the Indian Institute of Science, Bangalore, for his paper "Microwave cavity resonators—some perturbation effects and their applications" (published in October 1953). This is the first award of this premium, which is given for the most outstanding paper by an Indian scientist or engineer.

The Marconi premium to **Paul Eisler** of Technograph Printed Circuits Ltd. for his paper "Printed circuits—some general principles and applications of the foil technique" (published in November 1953).

The Dr. Norman Partridge memorial award to **J. A. Youngmark,** formerly with Goodmans Industries Ltd., for his paper "Loudspeaker baffles and cabinets" (published in February 1953).

Awards of Brabazon, A. F. Bulgin, and Leslie McMichael premiums have not been made this year.

Oswald Tippo, chairman of botany and dean of the graduate school at the University of Illinois, has been appointed chairman of the department of plant science at Yale University, effective at the end of the present academic year.

In November **Vilhjalmur Stefansson,** Arctic explorer, celebrated his 75th birthday at Dartmouth College, where since 1947 he has been Arctic consultant and where his extensive library on the polar regions is housed. It has been estimated that one of five published items in the Stefansson collection is not to be found in the Library of Congress, and that 40 percent of the collection's Russian material is equally rare.

Stefansson, who made his first Arctic expedition in 1906, was honored at a dinner and at a reception. He received messages of congratulations from many societies, including the National Geographic Society, the American Geographical Society, the Arctic Institute of North America, the Association of American Geographers, the Geographical Society of Berlin, and the Geographical Societies of Chicago and Philadelphia.

Stefansson was the first to demonstrate that a man from a temperate zone could live in the Arctic on the same terms as the Eskimos and survive. Altogether, he spent 11 yr living with the Eskimos of the Canadian Arctic and Greenland. In fact, on his first major expedition his supply boat became ice-bound and never caught up with him. He moved in with the local Eskimos, adopting their clothes, their food and their work habits, and learning their language.

Cornell University has announced the appointment of **Don W. Fawcett,** assistant professor of anatomy at Harvard Medical School, as professor and head of the department of anatomy at Cornell Medical College in New York, effective 1 July 1955. He succeeds Joseph C. Hinsey, who left the position last year to become director of the New York Hospital–Cornell Medical Center. Fawcett's research has been mainly in microscopic anatomy, including studies of the circulatory adaptations of aquatic animals, the mechanism of implantation of mammalian ova, the histochemistry of adipose tissue, and the ultrastructure of the kidney and liver as revealed by the electron microscope.

Joseph F. Libsch, professor of metallurgy at Lehigh University, has received the annual $2000 award from the American Society of Metals for outstanding contributions to the teaching of metallurgy. The prize was presented to him at the 36th metallurgy congress and exposition held recently in Chicago.

Léo Marion, director of the division of pure chemistry of the National Research Council of Canada, has been elected president of the French Canadian Association for the Advancement of Science for 1954–55. Marion was honored with the degree of Doctor of Science *honoris causa* by Laval University on 7 Nov.

Tyozabura Tanaka, citrus taxonomist and professor of horticulture at Tokyo Agricultural University, will spend the current academic year in the department of subtropical horticulture at the University of California at Los Angeles as a Fulbright scholar. He will devote most of his time to his studies of the classification of citrus fruits and their relatives according to natural relationships. He will also continue his revision of the well-known work *Sturtevant's Notes on Edible Plants,* of which he says: "Although this is one of the most complete works on the subject of edible plants, it omits many known in China and Japan and to American Indians."

George L. Cunningham has been appointed head of the chemistry department of Horizons, Inc., Cleveland, Ohio, an industrial research organization. Previously he was associate professor of chemistry at the University of Cincinnati, and at the same time technical director of Commonwealth Engineering in Dayton, Ohio, and supervisor in chemistry at the Southwest Research Institute at San Antonio, Tex.

During November the Messenger lectures on submarine geology were given at Cornell University by **Phillip H. Kuenen,** head of the geology department at the University of Groningen, the Netherlands.

On 14 Dec., **H. P. Grace** of E. I. du Pont de Nemours and Co., Inc., Wilmington, Del. will receive the 1954 Junior Award in chemical engineering from the American Institute of Chemical Engineers. Given annually for "the paper judged most outstanding of those published by Junior members of the Institute during the last three years," Grace was cited for two papers, "What type filter and why?" and "Resistance and compressibility of filter cakes."

Headquarters of the Air Research and Development Command has announced that **Gertrude Blanch,** American mathematician who was born in Poland, has joined the staff of the Aeronautical Research Laboratory at Wright Air Development Center, Dayton, Ohio. Dr. Blanch, best known for her work on mathematical tables, is a specialist in obtaining numerical values for problems arising in mathematical physics and theoretical engineering. She is a pioneer in the application of large-scale digital computers and has authored more than 40 scientific publications, including 20 volumes of mathematical tables.

Her most recent work has been with Consolidated Engineering Co., Pasadena, Calif. Before that she was associated with the Bureau of Standards and the Institute of Numerical Analysis at the University of California at Los Angeles.

Earle R. Caley, professor of chemistry at Ohio State University, has received a citation for his contributions to humanistic studies. The presentation was made by the department of classical languages on behalf of the American Classical League.

United Cerebral Palsy has presented its annual $1000 Max Weinstein award for outstanding scientific achievement in the field of cerebral palsy to **Seymour S. Kety,** associate director in charge of research for the National Institute of Neurological Diseases and Blindness and the National Institute of Mental Health, U.S. Public Health Service, Bethesda, Md. Kety was honored for his pioneering work in measuring the blood flow through the human brain. The results of his research are of fundamental importance to an understanding of cerebral palsy and many other neurological and medical disorders.

Norman C. Miller and **John D. Steely,** staff members of the University of California's Los Alamos Scientific Laboratory, have been jointly awarded the 1954 Coolidge award by the Society for Nondestructive Testing. They were honored for their article, "Some experimental findings and operating practices in betatron radiography," which was presented before the society at its 13th annual meeting and which appeared in the Nov.–Dec. 1953 issue of the society's journal. The article summarizes 3½ yr of experience at Los Alamos Scientific Laboratory in applying a 22-Mev betatron to various problems in radiographic inspection.

Edward L. Nelson, technical director of the Signal Corps Engineering Laboratories, Fort Monmouth, N.J., has been appointed scientific chief of Research and Development for the Army Signal Corps.

The Acheson medal and award was presented to **George W. Heise** by the Electrochemical Society during its recent annual convention in recognition of his outstanding technical achievements and his many contributions to the welfare and growth of the society. The award, consisting of a gold medal and $1000, is the society's highest honor. Associate director of the research laboratories of the National Carbon Co. in Cleveland, Ohio, at the time of his retirement last year, Heise is an authority on primary batteries and for many years has written on this subject for the *Encyclopedia Britannica.* At present he is chairman of advisory battery panels for both the Office of Naval Research and the National Research Council.

Heise has worked on many types of batteries. He invented the "air cell," an alkaline carbon-zinc system that uses oxygen from the air instead of manganese dioxide as an energy source. These cells have been in commercial production for over 20 yr. Heise holds 22 patents on dry cells, 32 on alkaline cells, and 18 others in electrochemical fields. His publications on corrosion, electroanalysis, catalysts, photochemical reactions, photography, radioactivity, and sorbent carbons show the wide range of his interests. During World War II, as technical representative for the Chemical Warfare Service and the National Defense Research Council, he headed a research group that developed methods for making highly effective gas-mask carbon from domestic raw material.

Benjamin F. Greene, Jr., John V. Harrington, and **William H. Huggins,** all from the Air Force Cambridge Research Center, have been awarded the Air Force's decoration for exceptional civilian service.

Greene is the developer of VOLSCAN, the new Air Traffic Control System; Harrington has accomplished outstanding work in the field of data transmission; and Huggins has established new approaches in the fields of electronic hearing and communications.

The AFCRC shared with Wright Air Development Center of Dayton, Ohio, the honor of having the most civilian personnel receiving the high award. Only 13 civilians throughout the Air Force were selected. Both centers are under the Air Research and Development Command.

Appointment of two new research associates at General Electric Research Laboratory, Schenectady, N.Y. has been announced: **Henry J. Fisher,** formerly a metallurgist in the Department of Mines and Technical Survey, Ottawa, Canada, and **Glenn M. Roe,** a theoretical physicist from the Knolls Atomic Power Laboratory.

Three men were honored at a recent meeting of the Franklin Institute: **Walter A. R. Pertuch,** librarian, became associated with the institute in 1904 and is celebrating his 50th year of service; honored for 50-yr memberships were **Frank S. Busser,** Philadelphia lawyer, and **C. Mahlon Kline,** chairman of the board of Smith, Kline and French Laboratories.

Necrology

Russel Burton-Opitz, 79, heart specialist, author, former president of the New York Cardiological Society, and former associate professor of physiology at Columbia University, New York, 18 Nov.; **Earl F. Farnau,** 71, retired professor of physical chemistry at the University of Cincinnati, Cincinnati, Ohio, 17 Nov.; **James T. Grady,** 75, former managing editor of the American Chemical Society News Service, Winsted, Conn., 18 Nov.; **Thomas D. Jones,** 55, authority on rheumatic fever, former research director of the Good Samaritan Hospital in Boston, and medical director of the Helen A. Whitney Foundation, New York, 22 Nov.; **Henry Keller, Jr.,** 59, professor of agricultural economics at Rutgers University, New Brunswick, N.J., 22 Nov.

Abraham A. Low, 63, associate professor of psychiatry at the University of Illinois Medical School, Chicago, Ill., 17 Nov.; **Peter I. Lukirsky,** 60, physicist, author, and corresponding secretary of the Physico-Mathematical Union of the Russian Academy of Sciences, Moscow, 15 Nov.; **James H. H. Muirhead,** 88, engineer and inspector for the Isthmian Canal Commission during the building of the Panama Canal, Patchogue, L.I., N.Y., 20 Nov.; **Wallace D. White,** 84, electrical engineer and inventor, Red Bank, N.J., 17 Nov.; **Anna W. Williams,** 91, bacteriologist, former

president of the Woman's Medical Association, and retired investigator of diphtheria, rabies, and trachoma for the New York Department of Health, Westwood, N.J., 20 Nov.; **Robert S. Woods**, 77, authority on electrotherapy, author, and retired head of the department of physical medicine and electrology in the London Hospital, London, 20 Nov.

Meetings

The 4th **Conference on Scientific Manpower,** sponsored by the National Science Foundation, the National Research Council, the Engineering Manpower Commission, the Scientific Manpower Commission, and Section M—Engineering of the American Association for the Advancement of Science, will be held in Berkeley, Calif., 28–29 Dec., in conjunction with the annual meeting of the AAAS.

The first session of the conference will be on *Implications of the Findings of the Commission on Human Resources and Advanced Training.* Papers on the implications as they affect the natural sciences, social sciences, and science teaching respectively will be presented by Lee A. DuBridge, California Institute of Technology; Conrad Taeuber, Bureau of the Census; and Ralph Tyler, Center for Advanced Study in the Behavioral Sciences. The second session will deal with *Prospective Developments in Utilization of Scientists and Engineers.* Raymond Ewell of the National Science Foundation and A. L. Lyman of the California Research Corp. will read reports on the "Estimated volume of research and development expenditures in 1955 by government and industry." Another subject to be considered is *Selective Service and Military Reserve Developments.*

All sessions of the conference are open to the public, and those interested in the problems of scientific and technical personnel are cordially invited.

The 4th annual **Symposium on Blood** will be held at Wayne University on 22 Jan. 1955. Those presenting papers include M. Mason Guest, Peter B. Samuels, Charles Brambel, Theodore H. Spaet, Joseph M. Hill, Charles A. Owen, Morris Tager, Helen M. Ranney, Raymond Monto, Benjamin Alexander, Jack Carter, and George D. Penick. The meeting will be held in the auditorium of the College of Medicine. A cordial invitation is extended to all interested persons.

Scientists specializing in the behavior and effect of ocean waves met for the first time with America's leading ship designers and builders from 25 to 27 Oct. at Stevens Institute of Technology, Hoboken, N.J. The College of Engineering of New York University was co-host with Stevens. This joint meeting of the **Society of Naval Architects and Marine Engineers** and the **Council on Wave Research** was particularly significant in view of increasing scientific interest in the destructive and useful aspects of energy contained in sea waves. Most of the problems considered were concerned with better methods of measuring and predicting various types of wave motion, and the effects of waves on ships, seaplanes, and landing craft.

Chairmen of the sessions were Columbus O'D. Iselin, Woods Hole Oceanographic Institution; K. S. M. Davidson, director of the experimental towing tank, Stevens Institute of Technology; K. K. Cowart, engineer-in-chief, U.S. Coast Guard, Washington, D.C.; H. E. Saunders, Bureau of Ships, Washington, D.C.; J. W. Johnson, secretary of the Council on Wave Research and professor of hydraulic engineering, University of California; H. de Lucee, assistant naval architect in the central technical department, Shipbuilding Division of Bethlehem Steel Co., Quincy, Mass.

The 3rd annual meeting of the **American Society of Tropical Medicine and Hygiene** was held jointly with the 21st annual meeting of The American Academy of Tropical Medicine and the 29th annual meeting of the American Society of Parasitologists at Memphis, Tenn., 3–6 Nov.

The Bailey K. Ashford award in tropical medicine (established by Eli Lilly and Co.) was presented to Joseph Greenberg of the National Institutes of Health, Bethesda, Md. The Joseph Augustin LePrince award in malariology (honorarium provided by the Michigan Chemical Corp.) was awarded to Brian G. Maegraith, dean of the Liverpool School of Tropical Medicine: it was accepted on behalf of Dr. Maegraith by William H. Taliaferro, University of Chicago. A symposium on schistosomiasis, consisting of five papers, was presided over by Donald B. McMullen of the Army Medical Service Graduate School, Washington, D.C. The C. F. Craig lecture on "Recent advances in our knowledge of dengue and sandfly fever" was delivered by Albert B. Sabin of the Children's Hospital Research Foundation, Cincinnati, Ohio: Frederick J. Brady, International Division of the Public Health Service, Washington, D.C., presented as his presidential address, "The future of tropical medicine."

New officers are: pres.-elect, Asa C. Chandler, Rice Institute; v. pres., Donald B. McMullen, Army Medical Service Graduate School. Councilors for 4 yr are M. C. Balfour, Rockefeller Foundation, and T. H. Weller, Harvard School of Public Health.

Organization of the **Italian Genetics Society** (Associazione Genetica Italiana) has been announced. The president is G. Montalenti, and G. Magni of the Istituto di Genetica, Universita di Pavia, Italy, is secretary-treasurer. Councillors are C. Barigoyzzi, A. Buzzati-Traverso and A. Chiarugi.

The second **Colloquium on Biochemical Problems of Lipids** will be held at the University of Ghent, Belgium, 28–30 July 1955, just preceding the 3rd International Congress of Biochemistry at Brussels. Investigators who wish to participate should address inquiries to Prof. R. Ruyssen, St. Janvest 12, University of Ghent, Belgium.

The **Association of Missouri Geologists** was organized at a meeting held at the office of the geology department of the St. Joseph Lead Co., Bonne Terre, Mo., 10–11 Oct. The idea for the association originated with O. R. Grawe, chairman of the geology department of the School of Mines and Metallurgy, University of Missouri. Through the courtesy of the American Association of Petroleum Geologists, a preliminary meeting was held on 15 Apr. during that society's annual meeting in St. Louis. Plans were made then for the organizational meeting.

The new association has 103 charter members of whom 61 were present at the Bonne Terre meeting. The following officers were elected: pres., O. R. Grawe, chairman, geology department, School of Mines and Metallurgy, University of Missouri; v. pres., Norman S. Hinchey, v. chairman, department of geology and geological engineering, Washington University; sec.-treas., Walter V. Searight, principal geologist, Missouri division of the U.S. Geological Survey and Water Resources, Rolla. Members of the executive committee are Frank Snyder, geologist for the St. Joseph Lead Co., Leadwood, and Athel G. Unklesby, associate professor of geology at the University of Missouri.

At the Bicentennial Conference of the **Columbia University College of Pharmacy** the following papers were read: "The role of drugs in nutrition," William H. Sebrell, Jr.; "Pharmacy's challenge in the problem of cancer," Cornelius P. Rhoads; "Chemotherapy in infectious diseases," Henry Welch; "The pharmaceutical approach to mental diseases," Nathan S. Kline; "Widening horizons in endocrine therapy," Wilbur W. Swingle; "Cardiac drugs and the aging problem," Harry Gold; "Pharmacy's impact on the economics of health," Louis I. Dublin; "The greater economy of today's health," George Bugbee; "Safeguarding your health," Lloyd C. Miller; "The pharmacist serves with many hands," George D. Beal; "The community's health information center, the pharmacy," Newell Stewart; "The role of pharmacy in the future of public health," W. Paul Briggs.

These papers will be published in a commemorative volume.

The **Society of Nuclear Medicine** will hold its 2nd annual meeting in Portland, Ore., 17–19 June 1955.

This society was formed in Jan. 1954 to facilitate the integration of the products of research into the practical application of radioactive isotopes in medicine, and at the same time to help its membership and keep abreast of developments.

There are two types of membership. Regular membership is open to authorized users of isotopes and their direct collaborators. They may hold their degrees in any field that is involved and an M.D. is not required or emphasized. Associate membership is open to people with adequate scientific education who are interested but not actively engaged in the field. There are now 141 members in 18 states and 5 foreign countries. Current officers are pres., Asa Seeds, 507 Medical Arts Bldg., Vancouver, Wash.; pres.-elect and chairman of the membership committee, Milo Harris, 252 Paulson Medical Dental Bldg., Spokane, Wash.; sec., Arthur Livermore, Reed College, Portland, Ore.; treas., Norman J. Holter, Helena, Mont.

A number of discoveries in the general knowledge of blood and use of blood for therapeutic purposes were announced before the **Conference on the Cellular Elements and Plasma Proteins of the Blood,** which convened in Cambridge, Mass., 15–16 Nov., under the auspices of Protein Foundation, Inc., a nonprofit organization dedicated to research on blood and related biologic problems, and to the qualitative control of biologic products. Among the new developments reported were the following: (i) The establishment of methods that make possible the utilization of red cells that have been preserved by deep-freezing in glycerol —thus enabling the effective stock piling of this fundamental blood component for ordinary medical use as well as for civil defense; (ii) the localization, employing new methods of fractionation, of a number of factors that exist in human plasma only in minute quantity, including the growth hormone, insulin, a gonadotropic factor related to the atrophy of the reproductive organs in menopause, and a phagocytosis-promoting factor that plays a vital role in combating infection.

Basic to much of the discussion that took place at the conference were the several papers dealing with the perfection of the ADL-Cohn Blood Fractionating Machine, which was developed by the late Edwin J. Cohn and his associates at Harvard University. This apparatus, which has entered into production only within the last several months, takes blood from the veins of the donor, and, in one continuous process in a closed sterile system, removes calcium to prevent coagulation, reduces temperature to minimize chemical change, quickly separates the blood into a series of constituents (white cells, red cells, platelets, gamma globulin, stable plasma protein solution, and so forth), and packages each fraction in a sterile plastic container, ready for immediate use or transfusion. By varying the internal design of the replaceable centrifuge cartridges, different types of separation can be effected. The machine was developed and engineered in collaboration with Arthur D. Little, Inc., of Cambridge, which is now producing a limited number for distribution to qualified research centers.

Reports were also delivered on the progress that had been made in preserving platelets and in employing them therapeutically in certain cases of hemorrhagic bleeding. Less than 3 yr ago general medical opinion held that platelets were so fragile that their preservation could not practicably be considered. By using gelatin as a suspensory medium, however, it has been possible to preserve platelets for many months. Preliminary clinical tests employing preserved platelets in hemorrhagic conditions related to platelet deficiency have been altogether favorable.

Contrary to expectation, they can be used repeatedly on the same patient without reduction in effect. Although the supply of platelets is still extremely limited, emergency shipments have been made in certain cases.

The work on platelets is also of the greatest importance to the treatment of radiation injury. The two most serious effects of atomic radiation are the destruction of the white cells of the blood, without which the body has no resistance to bacterial infection, and the destruction of the platelets, without which the body is subject to uncontrollable hemorrhage. While there is still a vast amount of work to be done in this entire field, the establishment of methods of preserving and banking platelets, and their demonstrated effectiveness in clinical use, represents a highly important advance.

Society Elections

United Engineering Trustees, Inc.: pres., James L. Head, Anaconda Copper Mining Co.; sec., John H. R. Arms; treas., Waldo G. Bowman, McGraw-Hill Publishing Co. The vice presidents are W. J. Barrett, N.J. Bell Telephone Co.; and W. F. Thompson, Westcott and Mapes, Inc.

Hawaiian Academy of Science: pres., C. G. Lennox; pres.-elect, W. A. Gortner; sec., D. C. Cox; treas., B. Krauss.

New Mexico Academy of Science: pres., Sarah L. Cook, Albuquerque High School; v. pres., John Harty, New Mexico Institute of Mining and Technology; sec.-treas., C. Clayton Hoff, University of New Mexico.

International Association of Milk and Food Sanitarians, Inc.: pres., I. E. Parkin, Pennsylvania State University; pres.-elect, I. Van Nortwick, Kansas State Dairy Products Ass'n.; sec.-treas., H. H. Wilkowske, University of Florida; J. D. Faulkner, U.S. Department of Health, Welfare and Education; H. Barnum, Denver Department of Health and Hospitals. The vice presidents are H. S. Adams, Indiana School of Medicine, and P. Corash, New York City Health Department.

American Society for the Study of Arteriosclerosis: pres., L. N. Katz, Chicago, Ill.; v. pres., A. C. Corcoran, Cleveland, Ohio; sec.-treas., O. J. Pollak, Box 228, Dover, Del.

AAAS, Springfield, Massachusetts Chapter: chairman, Henry A. Walter, Monsanto Chemical Co.; v. chairman, Seth Arsenian, Springfield College; sec.-treas., Philip H. Cinis, 73 Melha Ave., Springfield.

AAAS, Arctic Branch, Alaska Division: pres., Earl H. Beistline, University of Alaska; v. pres., Clyde J. Beers, Coast and Geodetic Survey, College, Alaska; sec.-treas., J. C. Cain, University of Alaska.

The Association of Consulting Chemists and Chemical Engineers, Inc.: pres., Charles Davidoff, Consulting Chemical Engineer; v. pres., Lincoln T. Work, Consulting Chemical Engineer; sec., Elliot A. Haller, Haller Testing Laboratories; treas., Percy E. Landolt, Landolt & Whitney.

American Society of Clinical Pathologists: pres., Frank B. Queen, University of Oregon; pres.-elect, Emma Moss, Charity Hospital, New Orleans; v. pres., Elbert DeCoursey, Armed Forces Institute of Pathology; sec.-treas., C. G. Culbertson.

Education

The department of mechanical engineering in the Technological Institute of **Northwestern University** has expanded its facilities by the creation of the Gas Dynamics Laboratory. Now almost 1 yr old, the laboratory has been working on fundamental problems underlying the operation of gas turbines, jet propulsion, and rockets. Financed by the university, the laboratory serves three main functions in providing: (i) research work for graduate students; (ii) instruction in the fields of compressible fluid-flow and high-velocity combustion processes; (iii) unclassified research under contracts from private industry and/or governmental groups; (iv) the organization of postgraduate symposiums and conferences for those interested in high-velocity flow processes.

So far the emphasis in research has been in the field of turbulent combustion such as that encountered in jet engines. However, preparations are under way to study the combustion instability problems encountered in rocket motors. Four day and three night courses are being offered. A symposium to discuss aerothermochemistry has been announced and is scheduled for 22–24 Aug. 1955.

The National Heart Institute of the U.S. Public Health Service is conducting a research **training program in enzyme chemistry** at the Institute for Enzyme Research of the University of Wisconsin under the direction of D. E. Green. Candidates must possess a Ph.D. or M.D. degree. Stipends conform to those in effect for postdoctorate research fellows of the Public Health Service. Application forms and further information may be obtained from the Institute for Enzyme Research, Madison, Wis.

Establishment of a cooperative research affiliation between the School of Veterinary Medicine of the **University of Pennsylvania** and the **Mexican Government's** Institute of Livestock Research (the Institute de Investigaciones) located at Palo Alto, near Mexico City, has been announced. Financial support for the project to the extent of $18,000, is being supplied by the Foreign Operations Administration. The E. R. Squibb and Sons de Mexico, a subsidiary of the Olin Mathieson Chemical Corp. of New York, and also E.

R. Squibb and Sons, New York, are parties to the affiliation and will also assist in financing the Palo Alto undertaking.

Mutual cooperation in the investigation of contagious animal diseases of importance to both countries, with active assistance from the two governments, is the prime objective of the affiliation. Geoffrey W. Rake, microbiologist who joined the faculty of the university's veterinary school a year ago, will direct research work for the university at Palo Alto. He has been named chairman of a faculty scientific committee to guide the project.

The FOA grant will enable the faculty to encourage graduate training for Mexican veterinarians and other scientists who are interested in pursuing additional education and experience in the field of infectious diseases affecting animals, with particular emphasis on those diseases transmissible to man.

Under terms of the agreement, the University of Pennsylvania is to have use of existing facilities of the Institute at Palo Alto. A main laboratory there has been set aside for collaboration in research. It has been designated as the Squibb-Mathieson Laboratory for Veterinary Research of the Ministry of Agriculture and Husbandry in Mexico and of the University of Pennsylvania. A dedication program was held 17 Nov.

Selected faculty members from the veterinary school in Philadelphia are to be sent to Mexico as principal investigators on research projects. In addition to available personnel, it was announced that the university has appointed Carlos España as a research associate in microbiology assigned to the Palo Alto laboratory. España is a native Mexican who, following his graduation from the University of Mexico, went to California to complete his graduate training in microbiology at the Hooper Foundation of the University of California.

Available Grants and Fellowships

The **Educational Testing Service,** Princeton, N.J., is offering two fellowships in psychometrics for 1955–56. These are $2500 renewable research fellowships that provide for training in the Princeton offices of the service in addition to a full-time program of graduate work for the Ph.D. degree at Princeton University in psychological measurement and allied fields. Students in the program are offered a broad training in various fields of psychology, including experimental, social, and theoretical psychology. Special training is also given in modern quantitative methods as applied to problems in learning and in attitude measurements as well as in the techniques of developing aptitude and achievement tests.

Suitable undergraduate preparation may consist either of a major in psychology with supporting work in mathematics or of a major in mathematics with some work in psychology. However, in choosing fellows primary emphasis is given to superior scholastic attainments and demonstrated research ability rather than to specific course preparation. To be considered, a candidate must either (i) have taken the Graduate Record Examinations in 1954; or (ii) register by 13 Jan. to take these examinations on 27 Jan. 1955. *Fellowship applications are closed on 13 Jan. 1955.*

In a gift to the American Academy of Arts and Sciences in 1796 Count Rumford established a fund, the interest of which was to provide a Rumford award "to the author of the most important discovery or useful improvement . . . on Heat or on Light." Since 1832 a portion of the income of this fund has been devoted to supporting research. The designations, heat and light, have been interpreted broadly to cover the entire area of radiation and energy exchange. The research that may be supported therefore extends beyond physics into areas of chemistry, engineering, astronomy, biology, and geology.

Applications for research grants from the **Rumford Fund** may be sent to the Chairman of the Rumford Committee, American Academy of Arts and Sciences, 28 Newbury St., Boston 16, Mass. No prescribed form need be followed. Applications for grants for the coming year should be submitted *before 31 Jan. 1955.* A clear statement should be made of the objective of the investigation, the expected duration of the project, the institutional support, and previous contributions to the field by the applicant. In general the awards do not exceed $1000. It is felt by the committee that in spite of the present availability of larger research funds from various sources, there exists a need for small, free, uncommitted grants.

Grants and Fellowships

The **Research Corporation,** New York, has announced the award since 1 July of $124,000 in support of research in the physical sciences and mathematics. Grants from the **Williams-Waterman Fund,** which is administered by the Research Corporation, total $65,000. This fund was established in 1935 when Dr. Williams, Robert E. Waterman, and their associates assigned to the foundation their patents on the synthetic production of vitamin B_1.

Talladega College. E. H. Hoerger. Adsorption affinities of organic functional groups.

Pomona College. C. F. Allen. Asymmetric induction during catalytic hydrogenation of acyclic carbon-carbon double bonds.

Colorado Agricultural and Mechanical College. C. O. Guss. Intramolecular displacement of carboxylate ion.

University of Connecticut. Lewis Katz. X-ray studies in polymorphism.

Northwestern University. Vlasios Georgian. Synthesis of steroids.

Northwestern University. Kaj A. Strand. Research in double star astronomy.

Southern Illinois University. M. J. Arvin. Electrical effects at the surface of semi-conductors.

University of Chicago. S. MacLane. Program in pure mathematics.

Loyola University. Paul B. Pickar. Low temperature studies on the electrical properties of the semi-conductors lead telluride, lead selenide, cadmium selenide, and titanium dioxide.

Tulane University. H. B. Jonassen. Studies of metallated dye complexes.

University of Maryland. C. E. White. Determination of optimum wave length for exciting fluorescence and determination of the fluorescence spectrums for various chelate compounds of analytic importance.

Amherst College. James Nicol. Method of cooling by cascade adiabatic demagnetization and application of the method to an investigation of the magnetothermal properties of substances below 0.1°K.

Clark University. J. L. Bullock. Polarographic investigation of lakes of some hydroxyanthraquinones.

University of Massachusetts. R. S. Stein A correlation of polymer crystallinity and orientation as determined by x-ray diffraction, light scattering from solid films, and birefringence.

University of Mississippi. S. F. Clark. Synthesis of synergists for DDT.

Park College. Delta W. Gier. Study of the hydrazides of quinolinic acid.

Nebraska Wesleyan University. W. R. French, Jr. Atmospheric effects on ground level cosmic ray intensity.

Dartmouth College. David M. H. Kern. Kinetics of irreversible electrode reactions involving metallic ions and the constant current coulometric analysis with +5 uranium.

Rutgers University. C. E. Erickson. Study of mixed boron amines and their dimers.

Rutgers University. J. S. Showell. Mode of hydrogen transfer in the Doebner-Miller reaction.

Rutgers University. S. T. Zenchelsky. Modern methods applied to thermometric titrations.

University of New Mexico. R. R. Brown. Time variations of cosmic radiation.

New York University. B. R. Sundheim. The radial distribution functions of an ionic fluid.

Polytechnic Institute of Brooklyn. Rudolph Marcus. Studies on the behavior of the dicarboxylate ions.

Union College. G. W. Ewing. Investigation of chemical analysis by means of controlled cathode potential electrodeposition.

Duke University. W. M. Fairbank. Use of microwave oscillators stabilized by superconducting cavities to measure the critical velocity of superfluid flow in helium-2.

University of North Dakota. E. A. Whalin, Jr. π^-/π^+ ratio from deuterium near the photomeson threshold.

Case Institute of Technology. M. J. Astle. Investigation of ion exchange resins as catalysts for organic reactions.

Western Reserve University. R. L. Dannley. Synthesis of trifluoromethyl choline.

Western Reserve University. E. L. Pace. Calorimetric investigations of the heat capacity between 1 and 20°K.

University of Oklahoma. S. H. Wender. Chemical synthesis of radioactive quercetin and related flavonoid compounds.

Lewis and Clark College. J. H. Karle. Astronomical photoelectric photometry.

Carnegie Institute of Technology. M. Simnad. Heterogeneous condensation of metals from atomic beams and surface diffusion.

Lehigh Unviersity. E. M. Kosower. Properties of cyclopropylmethide ions.

Lehigh University. R. C. West, Jr. Preparation and reactions of a cage compound containing a silicon atom at the bridgehead.

Pennsylvania State University. E. A. Mason. Measurement of thermal diffusion in gases by means of radioactive tracers.

Swarthmore College. G. P. Haight. Use of substituted ammonium salts as precipitants for certain anions.

Temple University. M. D. Stern. Light scattering investigation of the (a) interaction of pepsin with bovine serum albumin as a function of *p*H, ionic strength and concentration of interactants.

University of Pittsburgh. R. J. F. Palchak. Thiophene syntheses: scope and limitations of the reaction between phosphorus pentasulfide and γ-Keto acids in solution.

University of Scranton. F. C. Witkoski. Hydrolysis of some aliphatic chloroethers.

University of Rhode Island. S. MacKenzie. Usnic acid, exploration of synthetic routes.

Prairie View Agricultural and Mechanical College. C. T. Stubblefield. Kinetics of the oxidation of $SmCl_2$, $YbCl_2$, and $EuCl_2$ in HCl solutions.

Saint Edward University. R. Fleck. Specificity in the Meyer-Schuster rearrangement and the Rupe reaction.

Texas Southern University. R. F. Wilson. Spectrophotometric and polarographic study of certain rare earth elements.

West Virginia University. C. W. Muth. Synthesis and properties of some azabenzazulenes.

University of Wyoming. F. J. Bueche. Strength of plastics.

American University of Beirut, Lebanon. Costas H. Issidorides. Preparation of ethers of pentaerythritol and preparation of trimethylene oxides.

Williams-Waterman Fund grants

University of Cape Town, Union of South Africa. J. F. Brock. Etiology of kwashiorkor.

Christian Medical Hospital, Vellore, India. J. S. Carman. Village and hospital survey of nutritional deficiencies, with especial reference to vitamin deficiencies in Vellore.

Women's Christian College, Madras, India. E. D. Mason. Aspects of nutritional problems related to the diets of South India.

Northwestern University. Two fellowships in the field of medical nutrition.

Adelphi College. L. D. Ellis. Role of riboflavin in storage of vitamin B_{12}.

Institute of Nutrition, University of the Philippines. C. R. Pascual and others. Evaluation of the protein quality of Philippine food plants and other protein foods.

South Pacific Commission, South Pacific Area. Brian Freeston. Analysis of Pacific Islands foods with particular reference to their vitamin content.

Louisiana State University. V. R. Williams. "Biotin-oleic acid interrelationship in micro-organisms."

North Texas State College. F. I. Scoular. Metabolism studies of young college women.

Instruments

A new electric **microgram balance** with a load capacity of 500 mg registers changes in weight with accuracy to 1 μg. A change in weight produces a torque moment that is equalized by a compensating current. The current can be used to operate any calibrated indicating instrument such as a milliammeter, reflection galvanometer, or ink recorder. The instrument, which operates from a 115-v 60-cy/sec power source, is equipped with a stabilized power supply, null indicator, range switch, sensitivity control, mechanical and electric zero adjustments, and an indicating instrument of the type desired. (Sartorius Div., C. A. Brinkmann and Co., Dept. Sc., 378–380 Great Neck Rd., Great Neck, N.Y.)

A circular, rotatable **Warburg apparatus** has been announced by Bronwill. The unit, 31 in. high and 20 in. in diameter, comes in two models, one for standard work and the other for photochemical work. Both models have six reproducible shaking speeds, three amplitudes, temperature constancy of ±0.01°C, magnetically-operated tilting reaction vessels, and a platform rotatable through 320 deg, which permits any of the 14 double-capillary, single-rod manometers to be easily read. (Bronwill Scientific, Inc., Dept. Sc., 131 Gould St., Rochester 7, N.Y.)

Large numbers of soiled pipettes can be cleaned quickly with a new automatic **pipette washer.** The apparatus pumps an automatically heated and controlled cleansing solution through the bore of the pipettes, completing a wash-rinse cycle every 55 sec. Five or six cycles are sufficient for thorough cleansing. The capacity is 200 pipettes per cycle. (E. Machlett & Son, Dept. Sc., 220 E. 23 St., New York 10.)

The RCL Scale of 4096 is a new **scaler** designed for use with linear amplifiers, differential pulse height selectors, and other equipment that produces relatively large output signals. The scaler is of the Higin-

botham type with a pentode Schmidt trigger discriminator input. Resolution is approximately 1 μsec. Cascade connection is provided for series operation of two scalers. All critical resistors are Allen-Bradley 1 or 2 w, with resistance tolerance of ±5 percent, and all tube sockets have beryllium copper contacts. The register is a 220-v d-c Veeder-Root panel-mounted unit. There is neither a high voltage supply, amplifier, nor clock. The transformer and choke are hermetically sealed and the plate supply voltage input capacitor is oil-filled. (Radiation Counter Laboratories, Inc., Dept. Sc., 5122 West Grove St., Skokie, Ill.)

Miscellaneous

A report on the ***World's High Altitude Research Stations*** has been prepared and is ready for distribution. The term ***high altitude*** is used to designate stations located above 7500 ft or above 2000 m. The report was prepared at the direction of the Joint Commission on High Altitude Research Stations, appointed originally by the International Union of Biological Sciences, reporting to the International Council of Scientific Unions. The work of collecting and editing the data on the stations was done by Robert Stampfli, secretary of the JCHARS, and by Serge A. Korff of New York University. Publication was financed by grants from the National Science Foundation and from the JCHARS.

The compendium gives the pertinent physical facts about each laboratory as reported by its director, and includes a listing of facilities at the station. The purpose of the listing is to enable any scientist having a problem that requires high altitude research facilities to ascertain what station or stations are the most suitable for his work. Data on approximately 50 stations located all over the world are listed. In addition there is a list of potential sites—that is, stations that have been occupied but no longer are active. The appendixes provide notes about electric power, about conversion of altitudes, and standard pressures and temperatures.

Copies of the report may be obtained gratis as long as the supply lasts by writing to Dr. Serge A. Korff, New York University, University Heights, New York 53, N.Y.; Europeans wishing copies may address Dr. P.v. Tavel, Hochalpine Forschungs Station, Buhlplatz 5, Bern, Switzerland.

The first complete medical directory of trade-mark and generally known products that might be involved in **accidental poisoning in the home** will be published within the next year. The book will list products, their hazardous ingredients if any, the degree of damage to be expected from swallowing them accidentally, and what to do about it.

Harold C. Hodge, professor of pharmacology and toxicology at the University of Rochester School of Medicine and Dentistry, and Marion Gleason, a research associate, have been working on the dictionary project for more than 4 yr. They have collected and analyzed data on about 15,000 products that will form the bulk of the dictionary's contents.

Callahan and Hollowell have announced publication of a weekly newsletter on the practical application of atomic energy and its by-products to industrial, agricultural, and economic uses. The new weekly is to be known as the ***Atomic Energy Guideletter*** and will have editorial offices in the Evans Building, 1420 New York Ave. NW, Washington 5, D.C. The editor-in-chief is Walter A. Shead, former Washington correspondent for the Western Newspaper Union.

The *Guideletter,* distributed on a private subscription basis, is designed to keep businessmen regularly informed on practical present and future uses of atomic energy and also on actions, policies, and licensing provisions of the Atomic Energy Commission. Callahan and Hollowell have been in partnership for several years in the publication of various newsletters of a specialized nature.

A final report on the Atomic Energy Commission's predoctoral and postdoctoral fellowship programs in the physical and biological sciences has been published by the University Relations Division of the Oak Ridge Institute of Nuclear Studies. The report is a valedictory for a program that, from 1 May 1948 until its termination on 30 Sept. 1953, provided support for 920 fellows at a time when no other major scientific fellowship program was in effect in this country. The **AEC fellowship program** was terminated when the National Science Foundation, which provides for a national fellowship program in the sciences, was established by act of Congress.

The AEC fellowship program was administered initially by the National Research Council. On 30 June 1950 administration was taken over by four regional fellowship boards: the Northeastern Fellowship Board, sponsored by Associated Universities, Inc.; the Midwestern Fellowship Board, sponsored by Argonne National Laboratory; the Western Fellowship Board, sponsored by the University of California; and the Southern Fellowship Board, sponsored by the Oak Ridge Institute of Nuclear Studies. The last, with administration centered in the University Relations Division, handled the entire program from 30 June 1951 until its conclusion.

Five programs are covered by the report: predoctoral fellowships in the physical sciences and in the biological sciences, and postdoctoral fellowships in the physical, medical, and biological sciences. Of the 920 fellowships awarded, 522 were for study in the predoctoral physical sciences; 213 in the predoctoral biological sciences; and 155 in the postdoctoral physical, medical, and biological sciences.

A limited number of copies of this report are available for use by offices or officials concerned with administration of fellowship programs and may be obtained by writing the University Relations Division of the institute.