devotes a chapter to the topic and several do not think it a subject worth listing in the index.

The research activities of Peirce during his first decade at Stanford covered a wide range of plants, including algae, lichens, liverworts, gymnosperms, and angiosperms. In many cases the stimulus for undertaking an investigation can be seen in his keen eye and inquiring mind when outdoors. Examples of this are his studies on colorless shoots growing from stumps of redwood and on the explosive discharge of antherozoids by certain liverworts.

The small number of articles published by Peirce in botanical journals during the following decade might lead to the erroneous assumption that he had done little research during this time. This is far from the case. The results of investigations during these years are available, but to find them one must go to the records of various federal and state courts instead of to scientific journals. The shift in the field of investigation arose through a proposal to build a large copper smelter a few miles north of Stanford. In order to forecast the probable effects on the vegetation of the area, Peirce was appointed a member of a panel commissioned to visit all other copper smelters in the United States that handled 1000 tons or more of sulfurous copper per day and to observe their effect on the surrounding vegetation. These field observations were supplemented by extensive studies on various plants in a greenhouse where definite amounts of one or more of the ordinary constituents of smelter smoke were introduced into the air. As a result of these and further studies, Peirce appeared as an expert witness in several suits involving damage to vegetation by fumes from smelters. In southern California he studied the extent of the damage to citrus groves that had been caused by cement dust from a nearby cement mill. In connection with this, he devised a quantitative method for showing the extent to which a layer of cement dust on a leaf reduces photosynthesis.

About 1920 Peirce turned to a new field of investigation—the ascent of sap in trees. A summary of his theory on the manner in which sap moves up a stem comprised his address as retiring president of the Botanical Society of America in 1933. This address, entitled "Observations on sap hydraulics," was published in 1934 in the *American Journal of Botany*.

George Peirce was a man greatly beloved by students and colleagues. As the memorial resolution adopted by the faculty of Stanford well states:

> His general philosophy of life was built around the central theme that to get the most out of life one must serve the University, the community, and one's fellow citizens with humility and a cheerful kindness. He lived his philosophy consistently and with a constant twinkle in his eye. His kindness was to him no effort—it was his way of life.

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News and Notes

A Cytological Congress

We present two reports on the 8th International Congress for Cell Biology for reasons suggested in the introduction to G. Pontecorvo's report: confusion between the terms cell biology *and* cytology. *Several of last summer's lists of Meetings and Conferences in* Science *(21 May, 18 June, and 16, 23, and 30 July) contained the following items for September, always separated by one other item:*

1–7. International Soc. for Cell Biology, 8th, Leiden, Netherlands. (W. H. K. Karstans, Botanical Laboratory, State University, Nonnensteig 3, Leiden.)

1–8. International Cytological Cong., Leiden, Netherlands. (P. G. Gaillard, Histologisch Loboratorium, Rijksuniversiteit, Leiden.)

We solicited two reports. Two arrived and our confusion became apparent. We believe the two complement each other and publish both with the permission of both authors.

The 8th congress of the International Society for Cell Biology was held in Leiden 1–8 Sept. 1954. About 300 biologists from Europe, Israel, the Americas, Japan, and India met in the picturesque Dutch university town. The meetings were held in the University Hospital and visitors were housed in Noordwijk, a North Sea resort a few miles away. The half-hour run in the streetcar to Leiden provided welcome opportunities for informal discussions or for simply enjoying the lush green of the Dutch landscape spotted with the vivid color patches of flower beds and crisscrossed by large and small waterways alive with windmills and boats.

The congress was divided into plenary sessions in the mornings, with 3 lectures of a general nature reviewing various fields of cellular biology, and meetings of 3 to 4 concurrent sections in the afternoons where short papers in the same fields were read. The main topics were (i) induced enzyme synthesis; (ii) intercellular substances in animals and plants; (iii) immunobiological concepts of growth and differentiation; (iv) biochemistry of gene action; (v) virus synthesis; (vi) mitochondria; (vii) nuclear and chromosome structure; (viii) thyroid secretion; (ix) morphogenetic interaction between cells; (x) cell division and mitotic poisons; (xi) active cell surface; (xii) submicroscopic organization of cytoplasm. There were also two sessions on cytochemistry and one on tissue culture. (Abstracts of the papers were printed in *Excerpta Medica* 8, No. 9).

From these topics and the titles of the papers presented one can see the wide ramifications of cell re-

search, which extends into almost every field of biology and connects with biochemistry and biophysics. To some extent such a meeting indicates the state of knowledge in the field and the directions in which research is moving. Most of the introductory lectures were very useful in doing this for various branches of cell research.

The formation of specific proteins in cells was illuminated, especially by reports on the study of induced enzyme synthesis. Experiments on yeast indicate that new enzyme is made directly from amino acids rather than from a more complex precursor and confirm the suggestion that ribonucleic acid is somehow involved in this process. The appearance of specific enzymes during ontogeny was used to study cellular differentiation. The sensitivity of serological methods was taken advantage of in the analysis of problems of cell growth, cellular differentiation, and interaction between cells and between cells and tissue fluids. In some cases it was possible to approach these problems in terms of changes in specific molecular populations.

Our knowledge of the intercellular substance in animals and plants was advanced through the use of new cytochemical methods and electron microscopy. Thus the chemical nature of this material in which most cells are imbedded, as well as its submicroscopic structure, has been explored. The nature of collagen and cellulose and the ways in which they are laid down by cells were discussed. The application of chemical techniques such as paper chromatography has given the geneticists new means of analyzing the effect of gene mutations and has strikingly shown that single gene mutations cause manifold changes in the phenotype, sometimes expressed morphologically but more often in the invisible chemical make up of cells. Viruses were discussed as examples of primitive cells but also because they produce profound changes in the structure and activity of cells. The formation of new virus particles has usually been the major interest and it was emphasized that more attention should be given to the metabolic aspects of the cell-virus complex as a tool in the analysis of cell function.

The large number of papers on mitochondria and the size of the audience bore witness to the great interest in these cell structures. The discovery in recent years of their biochemical functions as complex enzyme systems was paralleled by the elucidation of their internal structure through the electron microscope. It was realized also that mitochondria are not all alike but that both within the same cell and between different cells there are distinct types. Better methods for separation of different particles were described and will lead to rapid progress in this field. Several investigators showed beautiful electron micrographs of the internal structure of mitochondria with their complex membrane systems, and it was natural to look for a relationship between this structure and the organized enzyme systems proposed by the biochemist. The static picture given by the electron microscope was healthily counterbalanced by some magnificent films of mitochondria in living cells. One was impressed by the dynamic nature of the mitochondria continuously changing shape and position.

Among chromosomes the giant specimens in dipteran salivary glands and in amphibian oocytes received attention, especially with regard to visible expression of gene activity in modifications of structure along the length of the chromosome. It was evident that the detailed organization and significance of these chromosomes is not yet clear. In the past the electron microscope has not produced much information on chromosomes, but some progress has been made in studies which indicate that chromosomes of several plant and animal species consist of bundles of submicroscopic fibrils that are very similar in width in all species studied.

Nuclear growth is either the result of polyploidy, which leads to stepwise increase in the desoxyribonucleic acid content, or is an expression of metabolic changes that lead to increase in protein content without chromosomal reproduction, a fact neglected in earlier karyometric studies. Nuclear volume measurements, to be meaningful, must be accompanied by cytochemical studies. The nucleolus was reported to contain a self-reproducing coiled fiber, and evidence for the extrusion of material from nucleoli into the cytoplasm in living cultured cells was presented.

The division of a cell is a very complex series of reactions. Various chemicals that inhibit one or the other of the essential steps in mitosis (mitotic poisons) were again shown to be useful tools for the causal analysis of cell division. One must distinguish between agents that destroy mitotic organelles (for example, the spindle) and others that interfere with some essential metabolic step. Some of the well known antimitotics can be reversed in their action by certain chemicals (for example, colchicine by adenosine triphosphate) and such studies help in finding out how these mitotic poisons act. The control of cell multiplication in morphogenesis has been little understood. It was thus interesting to hear of experiments on cultured rat liver cells which confirm some previous evidence that specific substances released from a tissue into the body fluids inhibit division in those cells. If these substances are removed from the environment the cells involved will multiply again.

The cell surface is an active complex structure. Its role in the passive and active movement of material in and out of cells was the topic of several papers. An instructive film of amebas in motion demonstrated that these cells have a permanent contracting rear end which plays an important part in locomotion.

The most striking development in cell biology since the last congress was the increasing usefulness of the electron microscope in cell research. One can say that a new era of cell morphology has been opened that will link the world of the microscope with the world of molecules. The internal organization of long-known cell organelles has been revealed and the structure of the much-abused Golgi bodies is being clarified, but entirely new cytoplasmic units are also being discovered. The most interesting of these is the "ergastoplasm," cytoplasmic structures rich in ribonucleopro-

tein, which consist of a system of branched vesicles (endoplasmic reticulum) and opaque granules of the size of macromolecules. There is good evidence that this system functions in protein synthesis. It was described by several investigators in a large number of cell types. A survey of cytoplasmic organization in various tumors convinced many that the electron microscope is opening a new approach to the study of abnormal growth.

Another very active area in cell biology has been the qualitative and quantitative chemical analysis of cell components. A large number of papers described new methods and refinements of existing ones. Extremely small quantities of material can be extracted from single cells and analyzed by absorption spectrophotometry and ionophoresis, or studied *in situ* by cytospectrophotometry, historadiography or interference microscopy. Some of these methods can also be used on living cells and changes in certain materials can be followed for instance during the mitotic cycle.

The major purpose of such a meeting should be the critical discussion of controversial subjects and of work in progress, and the exchange of technical information and ideas. There was a general feeling that not enough time was allowed for organized discussion. Unfortunately it is the tendency of such meetings, especially if they get large, to spend more and more time listening to short papers on rapidly changing subjects, and less time on exchange of opinion. When three to four sessions on related topics have to be scheduled concurrently, it is an indication that the organization of the meeting needs to be changed. A few plenary sessions with reviews of the most active fields of research are useful to take stock. But the oral presentation of all the papers sent in is no longer desirable. A program committee should select papers that can serve as bases for good discussions and leave those that present straightforward data to be read by title. Some topics might profitably be organized as panel discussions. Many papers are best given in the form of demonstrations if enough space and time are set aside. This type of presentation was largely neglected at the congress.

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The 8th International Congress for Cell Biology was held in Leiden, Holland, during the first week of September 1954. For those readers who may not know what the term *cell biology* covers, it may be explained that the earlier designation was *cytology*. At the 6th Congress of Cytology in 1947 it was decided to form an international society, affiliated with the International Union of Biological Sciences, and to give it the job of organizing future congresses. For reasons which are not quite clear the society was called the International Society for Cell Biology, and the congresses were styled from then onward, International Congresses of Cell Biology.

The 8th congress had some features of organization that are well worth reporting. In the first place the majority of the members were lodged in a few hotels 20 min by tram from Leiden, in the holiday resort of Noordwijk. This gave plenty of opportunity for members to meet one another. The price of the hotels was high, which made things not too easy for those who were neither guests of the congress nor representatives of some organization. Apart from this financial shortcoming, the arrangement was just of the kind required for maximum informal contacts and discussion.

The meetings were organized on a somewhat novel pattern. There were three or four symposiums per day. The chairman of each symposium would deliver in the morning a paper, unfortunately not followed by discussion, to the congress in joint sessions. In the afternoon the symposiums constituted themselves into separate sessions of the congress, with one medium-sized paper by the "moderator" and other 15-min papers offered by members. This organization insured that individual members, not having the gift of ubiquity so necessary in present-day international congresses, could at least listen to the chairmen's papers in the morning. Some of these chairmen's papers were of high quality and gave to members in other fields a good bird's-eye view of a particular topic. Others were too specialized and, therefore, defeated the purpose of this otherwise excellent arrangement. The works of the sessions were just as miscellaneous, both in quality and content, as can be easily gathered from the ill-defined term *cell biology*. In fact, there are no fields of either biology or medicine that were not in some way touched upon by the congress: from induced enzyme synthesis to nuclear and chromosome structure; from viruses to active cell surfaces; from mitotic poisons to electron microscopy; from immunology to tissue culture. Cytochemistry and histological techniques came in, of course, at all possible levels.

This congress poses very clearly again the question of whether such gatherings will serve a useful purpose. Perhaps at no other congress was the answer as clear as here. They serve very little purpose of the kind that meetings of scientific societies, or small working conferences, try to fulfill. Most of the innumerable rushed and short papers would have been much better published in the usual way and read at leisure. On the other hand, in these times of increasing specialization, these meetings serve an extremely useful purpose in permitting contacts among people living far apart and engaged in diverse but related fields. Members who attended the Leiden congress have profited from it in inverse proportion to the number of afternoon meetings that they attended. The morning joint sessions were usually valuable for everybody. In the afternoon meetings there were few who could profit by listening to more than perhaps two papers. The value of future congresses of this kind will be judged exclusively on the basis of how much informal contact they have promoted.

The social activities of the congress struck just the

right balance between generous hospitality and overtaxing the stamina of members. The atmosphere was throughout extremely cordial. The highlight of the social events was a magnificent reception given by the Netherlands Government in the Rijksmuseum in Amsterdam, where members had the opportunity to admire its permanent treasures and an outstanding exhibition of Indonesian art.

The Dutch hosts, and particularly their president, P. G. Gaillard and their secretary, W. H. K. Karstens, can be rightly proud for a congress that has, more than many others, succeeded in promoting a large amount of cross-fertilization.

G. PONTECORVO

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AAAS Socio-Psychological Prize

Through the generosity of an anonymous donor, the AAAS offers an annual prize of $1000 for a meritorious essay in socio-psychological inquiry. The conditions of competition for the prize to be awarded at the 1955 annual meeting, Atlanta, Georgia 26–31 December, are as follows:

1) The contribution should further the comprehension of the psychological-social-cultural behavior of human beings—the relationships of these hyphenated words being an essential part of the inquiry. Whether the contributor considers himself to be an anthropologist, a psychologist, a sociologist, or a member of some other group is unimportant, as long as his essay deals with basic observation and construction in the area variously known as social process, group behavior, or interpersonal behavior. For ease of reference in the rest of this statement, this general area will be called *social behavior.*

2) The prize is offered to encourage studies and analyses of social behavior based on explicitly stated assumptions or postulates, which lead to testable conclusions or deductions. In other words, it is a prize intended to encourage in social inquiry the development and application of dependable methodology analogous to the methods that have proved so fruitful in the natural sciences. This is not to state that the methods of any of the natural sciences are to be transferred without change to the study of social behavior, but rather that the development of a science of social behavior is fostered through observation guided by explicit postulates, which in turn are firmly grounded on prior observations. It may be taken for granted that such postulates will include a spatial-temporal framework for the inquiry. It may properly be added that the essay should foster liberation from philosophic-academic conventions and from dogmatic boundaries between different disciplines.

3) Hitherto unpublished manuscripts are eligible, as are manuscripts that have been published since 1 January 1954. Entries may be of any length, but each should present a completed analysis of a problem, the relevant data, and an interpretation of the data in terms of the postulates with which the study began. Preference will be given to manuscripts not over 50,000 words in length. Entries may be submitted by the author himself or by another person on his behalf.

4) Entries will be judged by a committee of three persons considered well qualified to judge material in this field. The judges will be selected by a management committee consisting of the vice president and secretary of Section K and the administrative secretary of AAAS. The Committee of Judges reserves the right to withhold the prize if no worthy essay is submitted.

5) Entries should be sent to Dael Wolfle, Administrative Secretary, American Association for the Advancement of Science, 1515 Massachusetts Avenue, NW, Washington 5, D.C. Entries should be submitted in quadruplicate. The name of the author should not appear anywhere on the entry itself but should be enclosed on a separate sheet of paper which also gives the author's address and the title of his essay. To be eligible for consideration for the prize that will be awarded at the 1955 annual meeting of the Association, entries must be received *not later than 1 September 1955.*

Science News

Gerard P. Kuiper, an astronomer who is associated with the University of Chicago's Yerkes Observatory (Wis.) and with the McDonald Observatory (Tex.), has established that the **pole of rotation of Venus** is tipped at an angle of 32° to its path, compared with the earth's 23.5°. Further, Kuiper's observations indicate that a day on Venus, one rotation upon its axis, is not almost a year of earthly time, as some textbooks estimate, but probably not more than a few weeks. He believes that this rapid rotation is shown by the daily changes that occur in the dark and light bands with which the planet is covered. The bands, usually three bright ones and three dark ones, are thought to be parallel to the equator of Venus.

Kuiper's research was conducted with the aid of the 82-in. telescope at McDonald Observatory, which is operated jointly by the University of Chicago and the University of Texas. Details of the work are reported in the November 1954 issue of the *Astrophysical Journal.*

Navajo Indians **escape coronary thrombosis,** which kills nearly 0.5 million persons per year in the United States. According to a study by Jarvey Gilbert of Burbank, Calif., who practiced on the Navajo Reservation, no proved case of the disease was found among 10,267 admissions to the Navajo Medical Center general hospital, Fort Defiance, Ariz., during the period 1949–52. During the same period, St. Joseph's Hospital in Albuquerque, N.M., approximately 150 mi away, reported 146 cases of coronary thrombosis among 20,289 admissions.

A chemical that makes cells divide has been isolated in pure crystalline form by a research group at the University of Wisconsin. Carlos Miller and Folke Skoog of the botany department and Malcolm von Saltza and F. M. Strong of the department of biochemistry have named the compound kinetin. It has a molecular weight of only 215, and its chemical formula indicates that the molecule contains 10 atoms of carbon, 9 of hydrogen, 5 of nitrogen, and 1 of oxygen. Kinetin is obtained from desoxyribonucleic acid.

When just a trace of the new substance—as little as 10 parts in 10^6 million parts of other matter—is added to culture mediums for plant tissue cells that are long past the growth period, the cells divide and new cells continue to be formed indefinitely so long as kinetin is in the medium. The first signs of growth usually show up within 3 to 5 days. When the rejuvenated tissues are placed in another medium that lacks kinetin, they stop growing. In order that continuous growth occur, the hormone auxin must also be added to the medium. Similar effects of cell division have been obtained with extracts from both plant and animal sources, including herring sperm, calf thymus glands, brewer's yeast, malt, and coconut. The work was supported by the American Cancer Society, the Wisconsin Alumni Research Foundation, and the National Science Foundation.

The possibility of **radioactive contamination of public water supplies** from the use of nuclear weapons or from improper disposal of waste from atomic reactor installations, research organizations, or hospitals has intensified investigations of methods for dealing with such contamination. Removal of radioactive contaminants from water by ion-exchange slurry is among the latest of these methods tested by the Sanitary Engineering Branch of the Corps of Engineers Research and Development Laboratories, Fort Belvoir, Va.

The method consists in removing the radioactive contaminants from the water by the addition of commercially available ion-exchange resins. Attracted to the resins, the radioactive ions settle out with them after the solution has been agitated. Tests in laboratory jars indicated that under certain conditions the ion-exchange batch slurry treatment decontaminates radioactively contaminated water to a level suitable for emergency drinking purposes within 30 min.

The **Air Weather Service** of the U.S. Air Force has reported that last year its reconnaissance squadrons flew 57,573 hr, the equivalent of more than 6.5 yr, tracking and reporting weather over a sizable part of the globe. The data compiled is used by the U.S. Weather Bureau and by international meteorological organizations.

A **new radiochemistry laboratory** that will, for the first time, produce and maintain national standards of artificially produced radioactive hydrogen has been established by the National Bureau of Standards. The laboratory will also facilitate the production on a large scale of standard samples of other radioactive elements such as carbon-14, sodium-22, phosphorus-32, iodine-131, and gold-198. Another function of the new unit will be the development of the first national standard of tritium, a radioactive isotope of hydrogen that is widely used as a tracer in basic research and development work.

A statement issued by participants in a **Soviet conference of publishing** and printing workers that appeared on 20 Feb. in *Izvestia* criticized everything from the poor quality of Soviet paper to the dullness of Soviet fiction. It demanded, among other things, that scientific works be brought up to date and that more attention be given to the scientific achievements of other countries.

The report also stated that twice as many books were published last year as in 1940. The output was said to include 130 million copies of political publications, 234 million scientific and technical works, 259 million textbooks, 118 million volumes of fiction, and 117 million children's books.

Harold W. Pfautz of Brown University, chairman of the **Committee on Freedom and Responsibility in Research and Teaching of the Eastern Sociological Society,** has made public a statement by his committee that includes the following comments:

> Along with other fields of research and teaching, sociology has become increasingly subject to and aware of dangerous threats to that intellectual freedom which is essential to the discharge of its professional responsibilities. As a discipline which seeks to understand human behavior in society, sociology has a clear and special responsibility strongly to reaffirm the basic right and need of men to know the conditions of their existence. . . . Anything which hampers the freedom to pursue scientific investigation, or distorts the public's understanding of the aims of social science, does a major disservice to the advancement of knowledge. There can be no "iron curtain" of forbidden inquiries in social science when such knowledge is basic to social welfare.
>
> Freedom in research and teaching, therefore, is not a privilege conferred upon scientists and scholars for their sake, but a responsibility imposed on them for society's sake. . . . The sociologist must stand with his fellow scholars and scientists and with the informed public to maintain the social and political conditions requisite for increasing our knowledge of society. To do less would be to betray the ideal of professional responsibility which is the basis of his training. . . . Therefore, as one of many professional organizations of social scientists, the Eastern Sociological Society strongly affirms its support of academic freedom. By the same token, it protests against current abuses of legislative investigatory powers and their arbitrary interference with the essential work of our educational and research institutions. The Society will support its members in their right and obligation freely to study, speak, and write on all types of social issues. It invites all other groups similarly devoted to the preservation of individual freedom and responsibility and the advancement of knowledge to join in this common cause.

The 14th annual **Science Talent Search,** conducted by Science Clubs of America through Science Service, for high-school seniors was concluded 28 Feb. at a banquet at the Hotel Statler in Washington, D.C. Frederick P. Greenleaf of Allentown, Pa., whose interest is electrical engineering, and Kathleen A. Hable of Loyal, Wis., whose interest is medicine, won the two major scholarships awarded by the Westinghouse Educational Foundation [*Science* **121**, 286 (25 Feb. 1955)].

Donald A. Quarles, Assistant Secretary of Defense (Research and Development), was the main speaker at the banquet. Quarles pointed out that the need for scientific personnel in the most important areas—education and basic research, industry, and military research and development—is critical and that our system of supply of scientific and technical manpower needs a critical reexamination. The problem confronts us on local and state levels in the need for more and better trained science teachers; on the national level in the need for adequate defense in an age when nucleonics, aeronautics, and electronics have revolutionized warfare, and when our rivals who support a different system are extremely conscious of the need for a highly developed technology and highly trained scientific manpower.

Scientists in the News

F. W. G. White, chief executive officer of the Commonwealth Scientific and Industrial Research Organization, Australia, is spending 6 wk in Egypt under the aegis of the UNESCO technical assistance program to advise on the organization of Egyptian scientific research.

Walter Clay Lowdermilk, consultant to the United Nations on economic development, left in February for Tel Aviv, Israel. He has been invited to head the new department of agricultural engineering at the Israel Institute of Technology and to serve as consultant to the Government of Israel for a period of at least 6 mo. He is a specialist in soil and water conservation.

At the meeting of the American Academy of Orthopaedic Surgeons on 3 Feb., **Charles Weer Goff** was awarded the annual prize of a certificate of merit and $1000 for the best research in orthopedics during the past 3 yr. The award is supported by Kappa Delta, a national women's sorority. Goff was honored for work on the disorders and disturbances affecting growing centers of bones in children and young people. His research was conducted in Hartford, Conn., in association with Yale University, where Goff is an assistant clinical professor of orthopedic surgery.

W. Kenneth Davis, acting director of the Atomic Energy Commission's division of reactor development since the resignation of Lawrence R. Hafstad on 1 Jan., has been appointed director.

Felix Bloch, Nobel prize winner in physics of Stanford University, who a few months ago accepted the directorship of the European Center for Nuclear Research in Geneva, has asked to be relieved of his duties there. He wishes to be free of his complex administrative responsibilities so that he may return to scientific work. Twelve western European governments are sponsoring the center, the first joint project for large-scale nuclear research. Bloch will be succeeded on 31 Aug. by **C. J. Bakker,** professor of physics at the University of Amsterdam, who is at present a member of the organization's directorate and a director of the synchrocyclotron division.

Melvin Calvin, director of the bio-organic division of the University of California Radiation Laboratory and an authority on photosynthesis, has been chosen to present the 1955 Edgar Fahs Smith memorial lecture, which is sponsored jointly by the American Chemical Society's Philadelphia section and the University of Pennsylvania. He will speak on "The photosynthetic cycle" on 17 Mar. at the Museum of the University of Pennsylvania.

Henry R. Mahler, assistant professor at the Institute for Enzyme Research, University of Wisconsin, has been appointed associate professor of chemistry at Indiana University, effective in September.

Irwin C. Gunsalus, professor of bacteriology at the University of Illinois, Urbana, has transferred to the department of chemistry where he will head the division of biochemistry.

Bruno J. Zwolinski, senior physicist for the Stanford Research Institute, has taken a leave of absence to assist for 2 yr in the administration of the National Science Foundation's chemistry program.

Bartholomew W. Hogan, rear admiral, U.S. Navy, who entered the Navy Medical Corps in 1925, was sworn in as the new Surgeon General of the Navy on 15 Feb. Since last April he has served as deputy and assistant chief of the Navy Bureau of Medicine and Surgery, Washington, D.C.

Peter M. Millman, former chief of the stellar physics division of the Dominion Observatory, has joined the staff of the National Research Council of Canada as head of the section on upper atmosphere research in the Division of Radio and Electrical Engineering.

Rhodes W. Fairbridge, former lecturer in geology at the University of Western Australia and in 1953 a visiting professor at the University of Illinois, has been appointed professor of geology at Columbia University. He succeeds **A. K. Lobeck,** who has retired.

Nicola Abbagnano, professor of philosophy at the University of Turin, Italy, was a guest at the University of Texas Medical Branch, Galveston, during January. He gave a series of lecture and seminar discussions on "Contemporary philosophy in relation to medicine and science."

J. B. Blizard, formerly a nuclear physicist at the University of Connecticut, has joined the staff of the New England Institute for Medical Research in Ridgefield, Conn.

Karl B. McEachron, Jr., project engineer at the General Electric Co.'s Appliance Park, Louisville, Ky., has been appointed dean of undergraduates of Case Institute of Technology, effective 1 June. He will assume a portion of the duties now fulfilled by **Elmer Hutchisson,** who has been dean of the faculty since 1945. Hutchisson will devote full time to his responsibilities as dean of the Graduate School and director of research.

James A. Krumhansl, former associate professor of physics at Cornell University, has been appointed assistant director of research for the new research laboratories of the National Carbon Co., Cleveland, Ohio, a division of Union Carbide and Carbon Corp. His research has been primarily in solid-state physics, which, with related topics in chemical physics, will constitute a continuing interest.

The Landsverk Electrometer Co., Glendale, Calif., manufacturers of instruments for the measurement of radioactivity, has announced the appointment of **Don L. Collins** as vice president. Collins has been technical director of the Victoreen Instrument Co. since 1946.

Isidor S. Ravdin, professor of surgery at the University of Pennsylvania, has been promoted from brigadier general to major general in the U.S. Army Medical Corps Reserve. This is the first promotion to this rank ever to be achieved by a Medical Corps officer on inactive duty.

Necrology

Leo M. Christensen, 56, chemical research engineer, former assistant professor of chemistry at Iowa State College of Agriculture and Mechanic Arts, Ames, 10 Feb.; **Frederick W. Dences,** 78, authority on structural steel engineering, retired assistant division engineer of the American Bridge Co., Chicago, 11 Feb.; **William F. Gordon,** 82, otolaryngologist, former associate professor of diseases of the ear at Columbia University School of Medicine, New York, 10 Feb.; **David S. Jacobus,** 93, former president of the American Society of Mechanical Engineers, inventor, former instructor in experimental mechanics and engineering physics at Stevens Institute of Technology, Hoboken, N.J., 11 Feb.; **E. Russell Lloyd,** 72, consulting geologist, formerly with the U.S. Geological Survey, Midland, Tex., 14 Feb.; **John Lloyd,** 91, retired engineer, inventor of the Wyoming steam eliminator, Wilkes-Barre, Pa., 11 Feb.

Lawrence Martin, 74, cartographer, former professor of geography at the University of Wisconsin, authority on glacial studies in Alaska, author, former chief of the Map Division of the Library of Congress, Washington, D.C., 13 Feb.; **William D. Merrell,** 85, emeritus professor of botany at the University of Rochester, Rochester, N.Y., 11 Feb.; **Mortimer A. Munn,** 84, former engineering consultant with the Standard Oil Co., Cleveland, Ohio, 11 Feb.; **George S. Phipps,** 48, metallurgical specialist with Bell Telephone Laboratories, Murray Hill, N.J., 16 Feb.; **Robert E. Schlueter,** 82, authority on medical history, former associate professor of surgery at St. Louis University Medical School, St. Louis, Mo., 12 Feb.; **Alonzo H. Stewart,** 87, former instructor in clinical microscopy and bacteriology at the University of Pennsylvania, Philadelphia, 13 Feb.; **John F. Wallace,** 62, airplane parts designer and builder, Cleveland, Ohio, 13 Feb.

Meetings

Man's Role in Changing the Face of the Earth, an international symposium to be held 16–22 June at the Princeton Inn, Princeton, N.J., is announced today by the Wenner-Gren Foundation for Anthropological Research.

The symposium theme is intended to provide a basis for exploration of the question: What has been, and is, happening to the earth's surface as a result of man's having been on it for a long time, increasing in numbers and skills unevenly, at different places and times? It is felt that this subject is basic for obtaining perspective on the story of mankind. This story may be considered as man's own exploration of the various physical and biological conditions on the earth's surface as a result of the elaboration of human needs, capacities, aspirations, and values.

Three interrelated factors are involved: (i) the earth's resources; (ii) the numerical pressure of population upon, and sustained by, the resources; and (iii) man's differing cultures, or ways of life. Understanding these relationships involves knowledge of values, equipment and artifacts, and the social organizations by which people group themselves, function, and interpret resources and their use. Cultural development may be viewed as man's growing knowledge of, and control over, forces external to himself. By increasing his range of action, man has intervened more and more in the rest of the organic world. Man's evolutionary dominance is assured—only he himself can threaten it. Man has supplemented organic evolution with a new method of change—the development of culture, the transmission of organized experience, retained, discarded, or altered by further experience.

The symposium is intended to provide a focus of interest for persons with different theoretical and descriptive backgrounds. It is an attempt to survey the state of knowledge on a topic touched only in piecemeal fashion by individual disciplines. Emphasis is to be placed on the stimulation of cross-disciplinary thought.

Fifty-two background papers, each reviewing an aspect of the general theme and outlining problems

for future research, will provide the bases for discussion. The scope of the papers is indicated by the following outline of the general topics. (i) *Retrospect*: man's tenure of the earth; through the corridors of time; (ii) *Process*: man's impact on the sea; changes in water economy; soil and slope changes through human use; modifications of biotic communities; ecology of wastes; urban-industrial demands on the land; (iii) *Prospect*: limitations of the earth; role of man.

Participation in the symposium is limited to 80 invited scholars, of whom 17 are from outside the United States. All the background papers will be prepublished and circulated for study in advance. The symposium will meet for six working days, on each of which two 3-hr sessions are to be held. The sessions are wholly for discussion; no papers are to be read. The chairmen of these half-day sessions include Edgar Anderson, Alan Bateman, Marston Bates, Harrison Brown, F. Fraser Darling, Lewis Mumford, Carl O. Sauer, Paul B. Sears, Alexander Spoehr, and Joseph B. Willits.

The symposium was the idea of William L. Thomas, Jr., assistant director of research for the NSF, and was implemented by Paul Fejos, director of research. The plan was developed by the symposium cochairmen, Sauer, Bates, and Mumford, who selected the participants to be invited. The proceedings, which are to be published by February 1956, will be edited by Thomas and will contain not only the background papers but also a report based upon the discussions. The National Science Foundation, through a grant-in-aid-of-publication subsidy, is a collaborating sponsor.

The **2nd International Automation Exposition** will be held 14–17 Nov. at the Chicago Navy Pier. Exhibitors will show instruments, automatic controls, electronic computers, control valves, automatic dimensional gages, automation devices, mechanical attachments on process machinery, special production machines, conveyors and lifts of all types, and other custom-made material-handling devices. For information write to Richard Rimbach Associates, 845 Ridge Ave., Pittsburgh 12, Pa.

The division of biochemistry, the chemistry department, and the department of physiological chemistry of the University of California, Los Angeles, are sponsoring a symposium on **Amino Acid Biogenesis and Protein Synthesis** to be held 18–19 Apr. The following addresses will be presented: "Biogenesis of aliphatic amino acids in microorganisms," Sidney Weinhouse, Lankenau Hospital Research Institute and Institute for Cancer Research; "Biogenesis of aromatic amino acids in microorganisms," B. D. Davis, New York University College of Medicine; "Biogenesis of amino acids in mammals," P. P. Cohen, University of Wisconsin; "Stereochemical factors in amino acid metabolism," Alton Meister, National Institutes of Health; "Transfer mechanisms," C. S. Hanes, University of Toronto; and "Mechanism of protein synthesis," H. N. Christensen, Tufts College Medical School. All inquiries should be addressed to: M. S. Dunn, Dept. of Chemistry, University of California, Los Angeles 24, Calif.

The 33rd general meeting of the **International Association for Dental Research** will be held 18–20 Mar. at the Morrison Hotel in Chicago, Ill. During the past few years the diversity of the program at meetings of this association has attracted the interest of individuals in all fields of basic science—particularly chemistry, microbiology, anatomy, crystallography, metallurgy, and applied physics. Interested persons are invited to attend.

The 3rd annual scientific meeting of the Houston Neurological Society, to be held at the Texas Medical Center 18–19 Mar., is featuring a special symposium on **Hypothalamic-Hypophysial Interrelationships.** Included in the list of nine participants are two foreign visitors: Geoffry W. Harris, director of the Laboratory of Neurophysiology, Maudsley Hospital, University of London, England; and Pierre Gloor, research associate, Montreal Neurological Institute, Canada.

The Committee on Vacuum Techniques, Inc., invites the presentation of papers at the 2nd **Symposium on Vacuum Technology** to be held at the Mellon Institute in Pittsburgh, Pa., 7–9 June. The program will deal with equipment, instrumentation, fundamental developments in vacuum technology, standards, nomenclature, methods and techniques, and vacuum-system applications and processes. Those interested in presenting a paper should communicate with Mr. Rudy Koehler, Committee on Vacuum Techniques, Inc., Box 1282, Boston 9, Mass.

The 5th conference of the **International Society for the Study of Biological Rhythm** is to be held 15–17 Sept. at the Karolinska Institutet in Stockholm, Sweden. The principal themes are rhythmical phenomena in the nervous system; cybernetics; and rhythm and industrial medicine. For information, write to Prof. Ture Petrén, Karolinska Institutet, Stockholm 60.

The National Science Foundation is offering a limited number of travel grants to American scientists who wish to attend the meeting. Applications must be received by the foundation *before 25 April.*

A symposium on **Fundamental and Applied Advances in Chelate Chemistry** will be sponsored by the Polytechnic Institute of Brooklyn 29–30 Apr. in the Engineering Societies Building, New York, as a feature of its centennial year celebration, which is being conducted under the theme "Science, engineering, research for human well-being." Cooperating with the institute in the sponsorship of the meeting are the American Cyanamid Co., General Aniline and Film Corp., Geigy Industrial Chemicals, Chas. Pfizer and

Co., Inc., Versenes, Inc., Victor Chemical Works, and Monsanto Chemical Co. W. Conrad Fernelius of Pennsylvania State University is chairman of the symposium. Harry P. Gregor of the Polytechnic Institute is coordinator and will provide invitations to anybody wishing to attend. Advance abstracts will also be supplied upon request.

Experts from many fields will attend the 1955 **National Health Forum,** to be held in New York, 23–24 Mar. on the theme "Forecasting America's health." Roscoe P. Kandle is chairman of the forum, which will be conducted by the 49 national organizations that make up the National Health Council. The 1955 forum is a part of the council's 35th annual meeting, which will continue through 25 Mar.

A symposium sponsored by E. R. Squibb and Sons on **Recent Advances in the Use of ACTH, Cortisone and Hydro-cortisone in Veterinary Medicine** will take place at the Sheraton Plaza Hotel in Boston on 13 Apr. The symposium will include five sections: (i) physiology of the pituitary adrenal system; (ii) small-animal field uses of the hormones; (iii) research section on bovine ketosis; (iv) practicioner's panel on bovine ketosis; (v) question-and-answer period. The proceedings are open gratis to all interested veterinarians and scientists.

Education

The department of marine science of the **University of Miami** calls attention to courses leading to a master's degree, with specialization in marine biology, oceanography, and fisheries. Rising interest in the various aspects of the science of the oceans has made it impossible to meet the demand for trained marine biologists, oceanographers, and fishery biologists. Interested students with a bachelor's degree in zoology, physics, chemistry, or related sciences should communicate with the Dept. of Marine Science, University of Miami, Coral Gables, Fla.

The General Electric Co. has announced that it is entering into a contract with **Washington State College** to study the installation of a swimming-pool-type nuclear reactor at the institution. The contract is the first phase of an over-all plan to have a reactor functioning at the college within 2 yr. Harold M. Dodgen is directing the Nuclear Reactor Project for the college.

The **Institute of Biology: For Teachers of College Biology** will be held at the University of Wyoming, 18 July–19 Aug. The theme will be "Expanding horizons in biology." The institute is sponsored by the National Science Foundation, which has made provision for 25 stipends of $250 each for college teachers who wish to attend. The director will be William B. Owen, professor of zoology at the University of Wyoming, and the associate director will be Harry V. Truman of Denison University.

The primary purpose of this institute is to enrich the teaching of college biology. The program will feature guest lecturers, discussions, and conferences on (i) teaching general biology, (ii) teaching upper division courses, (iii) training of a college biology teacher, and (iv) field methods in biology. Emphasis will also be placed on laboratory demonstrations and a display of materials and equipment. Two weeks of the institute will be conducted at the University of Wyoming Science Camp in the Medicine Bow Mountains, where field exercises are to be stressed. Address inquiries to the director.

Boston College has announced a special intensive course in **modern industrial spectrography,** 11–22 July. The course is particularly designed for chemists and physicists from industry who desire to learn the techniques of emission spectroscopy as an analytic tool. An optional third week of laboratory practice will be made available. Information may be obtained from Prof. James J. Devlin, S.J., Physics Dept., Boston College, Chestnut Hill 67, Mass.

Work on a nuclear reactor and the structure to house it will begin soon at the **University of Michigan,** and completion is expected in the spring of 1956. The building will be an extension of the north end of the Phoenix Memorial Laboratory now being erected on the university's new North Campus. The windowless, three-story addition and reactor will be financed from a grant of $1 million made by the Ford Motor Company Fund to the Phoenix Project, the university's research program on the peacetime uses of atomic energy.

Initial operation of the reactor will be at an average power of 100 kw for 8 hr, with a peak of 1000 kw. This will provide the most intense source of neutrons and gamma rays that is operated by a nongovernmental agency and that is also open to scientific and industrial research on an unclassified basis.

Available Fellowships and Awards

The **Philadelphia College of Pharmacy and Science** is offering graduate assistantships in pharmacy for 1955–56. The term of service is 9 mo with a maximum teaching load of 12 hr/wk. Each assistant receives a stipend of $1000; tuition and all other fees are remitted. Men or women who have been granted the B.S. degree in pharmacy by a college of pharmacy accredited by the American Council on Pharmaceutical Education are eligible for appointment.

Graduate assistants may enroll in the graduate school in curriculums leading to the M.S. or Ph.D. degree in pharmacy and may major in pharmacy, pharmacology, pharmaceutical chemistry, or biological sciences. A partial schedule of studies, approximating two-thirds the full-time assignment, may be carried. The assistant will require two academic years to qualify for the M.S. degree.

Fellowships are available also to those who are

interested in graduate training in hospital pharmacy. Fellowship applications must be received by the college *no later than 15 Apr.* For further information, write to: Secretary of the Graduate Committee, Philadelphia College of Pharmacy and Science, 43rd St., Kingsessing and Woodland Avenues, Philadelphia 4, Pa.

The **Audio-Visual Center at Indiana University** has available for the coming academic year several graduate assistantships and part-time appointments for students who wish to take graduate work in audio-visual education and who have a particular interest in science and science teaching at elementary, secondary, and adult levels. Stipends range from $900 to $2400, depending upon the amount of time devoted to work activities. For information write to L. C. Larson, Director, Audio-Visual Center, Indiana University, Bloomington, Ind.

The ElectroData Corp. of Pasadena, Calif., manufacturers of the Datatron, has announced its 2nd annual university **scholarship program in computers,** 7 June–2 Sept. The financial-aid program, for students selected from leading universities, will comprise training in the structure and operation of digital computers, practical numerical analysis, the theory of programing and coding, industrial computer applications, and management of computer companies.

Records of no more than two students from any one university should be submitted *before 15 Apr.* Address applications to Dr. Paul Brock, ElectroData Corp., 717 N. Lake Ave., Pasadena, Calif. For each student selected to attend the course, ElectroData will grant $500 to the individual's university.

The **College of Forestry of the State University of New York** expects to offer 25 assistantships for the college year 1955–56. Stipends vary from $900 to $1350 for 9 or 12 mo. Assistantship holders are excused from paying tuition and laboratory fees of about $350 per year.

Recipients are required to assist in teaching and research work for a maximum of 15 hr/wk. Income derived from assistantship awards is subject to Federal income tax. Assistants may pursue studies leading to the master of forestry, master of science, and doctor of philosophy degrees. They may specialize in a number of fields related to forestry.

Specially qualified applicants will be considered for fellowships of from $1500 to $2000, sponsored by industry, research foundations, and Government agencies, that are awarded by the college for work on assigned research projects. Recipients are required to devote full time, except for course work, to these projects. Conditions of awards vary with sponsorship. Holders of these fellowships are also excused from paying tuition and laboratory fees. These fellowships are usually offered in such fields as wood chemistry, polymer and plastics chemistry, pulp and paper technology, wood technology and utilization, wood preservation, and pathology.

Research fellowships are also awarded in relation to the general program of research of the college and cover all the fields of forestry that are offered. Applications for 1955–56 should be made immediately. Detailed information may be obtained from the Chairman of Committee on Graduate Study, State University College of Forestry, Syracuse 10, N.Y.

In the Laboratories

The **Battelle Institute,** Columbus, Ohio, has awarded to the **American Machine and Foundry Co.,** New York, a contract for the design, engineering, and construction of a nuclear reactor. The reactor will be modeled after the bulk shielding reactor at the Oak Ridge National Laboratory and will be used primarily to provide an intense source of neutrons and atomic radiation for research uses. According to H. R. Nelson, manager of Battelle's department of physics and in charge of their new atomic research laboratories, the reactor will be designed to operate at 1000 kw on uranium-235 fuel. Together with auxiliary equipment and the building in which it will be housed, the reactor will cost an estimated $0.5 million and is slated to begin actual operation 1 Feb. 1956.

The **Diamond Ordnance Fuze Laboratories** in Washington, D.C., established in 1953 as a research and development installation under the Ordnance Corps, Department of the Army, has issued a call for trained scientific personnel. Positions are currently open for electronic scientists, physicists, and mechanical and electronic engineers; salaries range from $3410 to $8360. Interested applicants may write to L. P. Conners, Civilian Personnel Office, Diamond Fuze Laboratories, Washington 25, D.C.

Corning Glass Works has announced the establishment of five new departments within its research and development division. Senior research associates whose present activities have been expanded by appointment to new positions are Howard R. Lillie, manager of fundamental research; Edwin M. Guyer, manager of electric glass working; John H. Munier, manager of photosensitive product development; George W. McLellan, manager of general product development, and James K. Davis, manager of electronic product development.

Plans to build new jet engine research and development plants costing more than $12.5 million have been announced by the **Westinghouse Electric Corp.** The new facilities, which include both high- and low-power laboratories and an experimental engineering shop, will be located at the present site of the jet engine plant south of Kansas City, Mo., which Westinghouse leased from the Navy in 1948. A portion of the more than 230,000-ft² laboratory will be made available within the confines of the existing 80-acre building. The fuel and testing laboratories will be constructed on sites adjacent to the present jet engine plant.