News and Notes

Third International Conference on Low Temperature Physics and Chemistry

THE Rice Institute was host to 250 leading physicists and chemists concerned with the properties of matter at very low temperatures. The conference, held in Houston, Tex., Dec. 17–22, 1953, was sponsored by the Institute, the National Science Foundation, and the International Union of Pure and Applied Physics. More than 100 papers were presented and the sessions covered a wide range of studies at liquid helium temperatures. The delegates were from the leading laboratories in Australia, Belgium, Canada, France, Germany, Great Britain, The Netherlands, and the United States. C. J. Gorter of Leiden University represented the International Union. The conference permitted ample time for informal discussions by groups of from two to ten people, who thus were able to work out differences of opinion and clear up experimental problems.

It is no surprise that the properties of liquid helium isotope three received attention and that the new theory on superfluid liquid helium by R. P. Feynman of California Institute of Technology was much discussed. Steady progress has been made on the magnetic properties of matter at low temperatures, and a new magnetic cycle refrigerator capable of maintaining a constant temperature of 0.2° K was described by C. Heer and J. Daunt of Ohio State University. We shall mention here only a few of the papers that stimulated unusual interest. Space does not allow us to report many other valuable contributions.

Prof. Pippard described experiments on the residual flux trapped in superconducting tin-indium alloys. The experiments consist of measuring the flux frozen in a tin-indium cylinder after the superconducting transition has been effected by removing a transverse magnetic field. For tin with less than 1.8 percent indium, it is found that the percentage of flux trapped (defined as $8\pi M/H_c$, where M is the magnetic moment of the rod and H_c is the critical field for the temperature at which the transition is made) is constant at low temperatures and decreases near the critical temperature. For 2-percent indium content, the behavior is quite different. The percentage of flux frozen in is constant at low temperatures, but increases very sharply near the critical temperature. These results are taken as evidence that the indium impurity can lower the interphase surface energy between normal and superconducting regions, although criticism was raised concerning the solubility of indium in tin.

Dr. Faber reported on a continuation of his supercooling experiments. Due to the large difference in the critical temperatures of tin and aluminum, a large difference in the characteristic length (defined as $8\pi\alpha/H_c^2$, where α is the interphase surface free energy per unit area) is expected. This result is confirmed. It is proposed that a measurement of the penetration depth in aluminum will serve as a critical test between the predictions of the Ginzburg-Landau theory and the predictions of Pippard.

Dolocek reported a new and possibly more accurate method of determining the latent heat of transition from the super to the normal state of metals. He measured the magnetic field that will make this transition isothermal, and calculated the latent heat from the induced eddy currents.

Results of high-pressure research at low temperatures were presented by several investigators. C. A. Swenson of MIT described an apparatus capable of producing 10,000 atm pressure with which he is studying Young's modulus of selected materials at temperatures of from 300° to 4° K. In compressing solid hydrogen at 4° K, he found that at approximately 2000 atm the hydrogen escapes from the cylinder. As the gap between piston and cylinder is very small, this might mean that hydrogen melts at this pressure and temperature. M. D. Fiske of General Electric reported an ingenious "hot wire" technique by which he is able to obtain hydrostatic pressures with solid helium. G. O. Jones of Queen Mary College, University of London, presented his recent investigations of the effects of pressures up to 40,000 atm (obtained at the apex of a double cone clamped tightly before cooling) on the phenomenon of superconductivity. Jones found that this extreme pressure reduces the temperature at which tin, lead, and thallium become superconducting. For tin and lead the results are in accord with previous work at much lower pressures; but in the case of thallium, Jones' results are opposite in sign and thus contradict early low-pressure work and recent high-pressure work by Fiske, who used the same technique as Jones. An interesting result of Jones' work is that he has caused bismuth, which at extremely low temperatures has remained a normal conductor, to become superconducting at 7° K under 40,000 atm. Bridgman has shown that for pressures above 20,000 atm, bismuth converts to other modifications and so, as in the case of tin, one of the modifications of bismuth becomes superconductive.

There were a number of interesting papers on magnetism at low temperatures. Dr. Kurti reported the work on nuclear alignment done at Oxford, while Dr. Steenland discussed that at Leiden University. Various properties of nuclei have been determined, in particular the spin assignment of the various levels, the multipole character and parity changes of the transitions and, finally, the nuclear magnetic moment of the radioactive nucleus. The measurements consisted of the determination of the polar diagram of the gamma-ray emission and of the directions of the polarization of the gamma-rays. The work at Oak Ridge National Laboratory under L. D. Roberts and S. Bernstein showed the results on nuclear polarization of manganese salts as well as studies with Sm149 nuclei.

Several aspects of paramagnetic salts at extreme

low temperatures were discussed. Cooke reported the use of anisotropic susceptibilities, and Hudson and Steenland compared potassium chrome alum with chromic methylamine alum. Steenland concluded that at the lowest temperatures this chromium methyl amine alum behaves like an antiferromagnetic substance.

An interesting session on magnet design and techniques was led by D. de Klerk of Leiden University. Also, the paper by J. Goldman of Carnegie Institute of Technology on ferromagnetic and antiferromagnetic interactions at low temperatures should be mentioned.

The theory of liquid helium was a subject of considerable discussion. R. P. Feynman presented a paper on the nature of the elementary excitations in the liquid. At very low temperatures, near the absolute zero, the excitations consist of phonons, as has already been suggested by Landau. At temperatures above 0.6° K, other excitations are important. These excitations are similar to the "rotons" proposed by Landau and consist of the rotational motion of small groups of atoms. The Bose-Einstein character of He^4 is important to the existence of these excitations. Approaching the condensation from the high-temperature side, one finds a somewhat different picture. R. P. Feynman ascribes the lambda transition to the Bose-Einstein condensation, but has described the properties below the lambda temperature only in terms of the excitations mentioned above. These two separate points of view have not so far been reconciled.

H. N. V. Temperley also reported work on the theory of helium three and four. A theory which has since been published in the *Proceedings of the Physical Society, A,* described the structure of He^4 in terms of small aggregates of atoms, an interpretation somewhat similar to that presented by Feynman. The theory has the advantage that both helium transitions can be treated in one model. Dr. Temperley also described how the introduction of Van der Waals forces in an ideal Fermi gas could explain roughly the melting and evaporation of helium three.

The hydrodynamics of He^4 were given in a paper by P. Zilsel of the University of Connecticut. This paper was read by F. London. Prof. Zilsel indicated how the two-fluid model for liquid helium could be justified on the basis of the Bose-Einstein condensation.

Several experiments of fundamental importance to the theory of helium three were reported. Vapor pressure measurements down to 0.47° K, reported by S. G. Sydoriak and T. R. Roberts of Los Alamos Scientific Laboratory, are in agreement with the calculations of Chen and London, who have predicted that there is no excess of entropy at higher temperatures. These measurements indicate that there is no transition in He^3 at some lower temperature similar to the lambda transformation in He^4. The measurements of G. deVries and J. G. Daunt of Ohio State University and of Osborne, Abrahm, and Weinstock of Argonne National Laboratory on the specific heat of He^3 also indicate that there is no excess entropy at the temperatures investigated. Further, these measurements seem to show that the specific heat of He^3 is not linear with temperature, as would be expected for an ideal Fermi gas. However, all these experiments indicate that at around 0.5° K, nuclear alignment will set in, since they show that at just under this temperature the entropy of the liquid drops below R ln 2. This is the entropy of randomly distributed nuclear spins, and as the spins are presumably unoriented in the solid, this implies that the entropy in the solid will be greater than that of the liquid below this temperature. The melting curve would therefore have a negative slope, and Osborne *et al.* had previously pointed out that this disagreed with their measurements. They now withdraw this criticism because the capillary will always block at the minimum of the melting line if that minimum occurs at a higher temperature than is being measured. The nuclear susceptibility measurements of W. Fairbank, W. Ard, H. Dehmelt, and W. Gordy of Duke University also show that He^3 does not behave as an ideal Fermi gas down to 1° K, since the susceptibility does not become independent of the temperature as would be expected, but is still proportional to the reciprocal of the temperature. Drs. Guttman and Arnold of the University of Chicago reported experiments demonstrating the nonparticipation of He^4 in the superfluidity of He^4. They pointed out that several interpretations are possible.

A number of other experiments on the properties of helium four were described. Measurements at the National Bureau of Standards by J. R. Pellam and W. Hanson on the attenuation of second sound, and similar measurements by K. Atkins at Toronto, indicate that the normal thermal conductivity as well as the viscosity must be taken into account, as predicted by Khalatnikov. Measurements on the helium film reported by K. Mendelssohn and by L. C. Jackson indicate that the mechanism of the formation of the film is still not well understood. The thickness of the film seems to depend on the method of measurement, and the relation of the thick, saturated film to the unsaturated film is still something of a mystery.

Neutron diffraction by liquid helium was discussed by H. London and also by Dash, Sommers, and Goldstein.

Meissner reported the results of measurements of the viscosity of He^3 and He^4 gas and showed them to be in agreement with calculations of de Boer using Fermi-Dirac and Bose-Einstein statistics.

G. Hercus and J. Wilks of Oxford reported measurements of the specific heat of helium that are approximately 10 percent higher than those found by previous workers. Their results seem to be in accord with some of the thermodynamic data that are already available.

It was surprising to note the excellent agreement between the measured specific heat of copper and that calculated from the elastic constants measured at these low temperatures by Overton.

Measurements of the susceptibility of a paramagnetic salt between 1.2° and 4.2° by R. Erickson and

L. Roberts of the University of Tennessee and Oak Ridge National Laboratory indicate that the present vapor-pressure temperature scale for helium four may be in error by as much as 0.012° at the lambda point, in agreement with the results of Kistemaker. These conclusions are confirmed by comparison with other thermodynamic data.

C. F. SQUIRE
and the staff of
The Rice Institute

Houston, Texas

Science News

The following paragraphs on the trial establishment of special **committees to advise local draft boards on scientific personnel** appeared in the March issue of *Selective Service,* the official bulletin of the Selective Service System.

> Maj. Gen. Lewis B. Hershey, Director of Selective Service, has requested the State Directors of six selected States to establish advisory committees to provide a means whereby the System may be provided with reliable information on scientific, engineering, and other specialized personnel.
>
> When General Hershey sent the directive to the six selected States he . . . explained that the program was being set up on a trial basis for the purpose of testing the practical usefulness of such a program throughout the System.
>
> In view of the increasing technical nature of many occupations, it was felt by the Director of Selective Service and the Director, Office of Defense Mobilization, that some effort should be made to set up some type of system whereby local boards could be provided, in appropriate cases, with expert advice. . . . The States selected to try the program out are: Alabama, California, Michigan, New Jersey, New York, and Ohio. . . . The only direction General Hershey gave the State Directors in setting up the committees was the strong reminder that the functions of the committees will be *advisory* only.

An improved purification method, useful for the controlled blend of pure **germanium** with traces of other specific elements essential for transistor construction, has been invented by W. G. Pfann of Bell Telephone Laboratories. As an ingot of germanium passes through a hoop of induction-heating wire in this process, a narrow band of the germanium melts and its impurities are dissolved in the liquid zone as it moves the length of the metal bar. Only one part in ten billion of anything but germanium remains, while other material becomes concentrated at the end of the bar. This end is then sawed off, leaving the pure germanium ready for final reworking into transistor material.

An improved **machine for sorting physical objects** into a large number of categories has recently been developed by Jacob Rabinow of the National Bureau of Standards. Designed at the request of the Bureau of Census, the device was built to sort punched cards at the rate of 420 per minute. The principle is also applicable to sorting such other objects as mail, electrical and mechanical components, and farm produce, as well as checks, invoices, and other papers. All items that can be separated into a number of subdivisions can be handled by an electromechanical system similar to the NBS sorter.

The machine developed at the Bureau consists of five major components: (1) a sensing unit that reads the data-bearing cards and decides where they should go; (2) an addressing device that loads the conveyor with the cards and their corresponding address numbers; (3) a conveyor belt that carries both the card and its address number; (4) a series of recognition devices, actuated by the information-bearing mechanism of the conveyor belt, which operate trip mechanisms so that the cards are released from the conveyor; and (5) a series of receptacles, or gates to other devices, into which the material borne by the conveyor is sorted.

Four Harvard University botanists—Paul C. Mangelsdorf, Elso S. Barghoorn, Walton C. Galinat, and Margaret Wolfe (Radcliffe College)—have announced new evidence concerning the **origin of corn.** Their conclusions:

1. Corn is definitely a native of this hemisphere and did not originate in Asia; its North American history goes back at least 60,000 years.
2. Corn is not a descendant of a Mexican grass called "teosinte," though the latter did play a part in the development of modern corn through natural hybridization processes; teosinte is corn's closest relative and a contributor to its recent evolution.

Evidence for corn's North American origin was obtained in the summer of 1953 with the finding of fossilized grains of corn pollen at a depth of more than 200 ft beneath Mexico City. The pollen fossils were discovered in drill cores studied by Paul Sears of Yale University and Kathryn Clisby of Oberlin College. The pollen grains were first thought to be those of teosinte. Definite determination that they were not teosinte, but corn, was made by Dr. Barghoorn and Miss Wolfe, who have developed new laboratory techniques for distinguishing the pollen of corn from that of other grasses such as teosinte.

It was also reported that synthetic hybrid corn cobs, produced through the laboratory mating of modern corn and teosinte, closely matched in size and botanical characteristics prehistoric cobs found in caves in the southeastern United States. The research group's findings were obtained by pooling discoveries and observations with those of climatologists and archaeologists from many other colleges and museums. Among the latter was the National Museum of Canada, the Colorado State Museum, and the National Park Service.

South America's first cyclotron, built at the University of Chicago, is en route to Rio de Janeiro. One of the smallest in terms of physical size, the entire device is about 5 ft long by 2 ft wide, stands 3½ ft

high, and weighs 11 tons. Design and construction were supervised by Herbert L. Anderson, professor of physics in the University's Institute for Nuclear Studies, and Lester Kornblith, Jr. Working with them was Mario Donato Amoroso Anastacio, assistant professor in the Brazilian Center for Physical Research, who spent a year and a half at the university.

Funds for the project, some $85,000, were provided by the Brazilian government through its National Research Council. The U.S. Office of Naval Research cooperated in the venture by supplying the salaries of the American staff during the design and construction.

The **value of the polio vaccine** to be given a mass trial this year will be determined in a study directed by Thomas Francis, Jr., chairman of the department of epidemiology in the University of Michigan School of Public Health. The work will be financed by a grant from the National Foundation for Infantile Paralysis, which is sponsoring the trials of the vaccine, but it has been made clear that the project will be completely independent. An evaluation center will be established at the University of Michigan and the university's survey research center will assist in collecting data and preparing statistical analyses.

Scientists in the News

Edward L. Cochrane, dean of the School of Engineering at the Massachusetts Institute of Technology, has been appointed vice president for industrial and governmental relations, effective Apr. 1. He will be succeeded as dean by **Richard Soderberg,** head of the Department of Mechanical Engineering at MIT since 1947. In his new post, Prof. Cochrane will be concerned with the whole range of the Institute's responsibilities to industry and government.

Robert N. Cooley of the Department of Radiology, The Johns Hopkins School of Medicine, has accepted appointment as professor of radiology and chairman of the department at the University of Texas Medical Branch. A considerable extension of department facilities in the new John Sealy Hospital building is being developed under Dr. Cooley's direction.

Arthur Paul Dowling, former technical director at the Rock Island Millwork Company, has been appointed a full research plastics chemist at the Armour Research Foundation of the Illinois Institute of Technology.

On Mar. 14, the 75th birthday of Albert Einstein, a selection committee at the Institute for Advanced Study announced that the Einstein Award would be given this year to **Richard Phillips Feynman** of the California Institute of Technology. This award, established in 1950 by the Lewis and Rosa Strauss Memorial Fund, consists of a gold medal and $15,000. Previous medalists have been Julian S. Schwinger of Harvard University and Kurt Gödel of the Institute for Advanced Study.

Dr. Feynman, a graduate of the Massachusetts Institute of Technology, received his Ph.D. degree from Princeton University in 1952. He was professor of physics at Cornell University from 1945 to 1948. The main area of his research is quantum mechanics and, particularly, quantum electrondynamics. He has contributed to the development of some of the most important results and concepts of the decade. His treatment of quantum mechanics by the probability amplitude method, and the establishment of what is known as the Feynman diagram to account for possible particle transformations, are especially noteworthy.

Lynn L. Gee, a professor of bacteriology at Texas Agricultural and Mechanical College from 1948 to 1954, has been appointed professor of bacteriology and head of the department at Oklahoma Agricultural and Mechanical College.

In the Department of Bacteriology at the University of Nebraska, **Carl E. Georgi** has succeeded **G. W. Peltier** as chairman of the Department, and **Warren Engelhard,** formerly of Ohio State University, is teaching pathogenic bacteriology and immunology.

The University of Tübingen has conferred the honorary degree of Doctor of Natural Science on **Ross G. Harrison,** Sterling professor of biology emeritus, Yale University.

James Hodge, a leading British authority on gas turbines and jet engines, has been appointed visiting lecturer in Columbia University's Mechanical Engineering Department for the spring semester. He will give two graduate courses in the evenings. Mr. Hodge is senior consultant engineer of Power Jets, Ltd. and is also associated with the School of Gas Turbine Technology at Farnborough, Eng., where the first jet aircraft engine was developed by Sir Frank Whittle.

Albert H. Holland, Jr., since 1951 medical director of the Armour Laboratories, Chicago, has been appointed director of the Division of Medicine, Food and Drug Administration, U.S. Department of Health, Education, and Welfare. The post has been vacant since 1952 when Erwin E. Nelson resigned to head the Department of Pharmacology at the St. Louis University College of Medicine.

The Washington (D.C.) Academy of Sciences has announced that the following three men are winners of annual recognition awards.

Bernard L. Horecker, chief of the enzyme research group at the National Institutes of Health, for his research in enzymology. He found a new enzyme—pentose phosphate isomerase—and demonstrated the fixation of carbon dioxide, thus providing a new pathway of carbon dioxide assimilation. This led to his discovery of two hitherto unknown enzymes that catalyze the transformation of sugars.

Robert L. Henry of the Electronics Division of the National Bureau of Standards, for his technical direction of the large-scale engineering development proj-

ect known as "Project Tinkertoy." By his ingenuity and by his prolific invention of novel methods he has been responsible for basically unusual systems of design and construction of electronic equipment. Dr. Henry's techniques have made it possible to manufacture intricate apparatus by mechanical means rather than by hand-assembly methods.

John R. Pellam, chief of the Cryogenics Physics Section at the National Bureau of Standards, for his many contributions in the field of low temperature physics. He has made two discoveries of importance for the development of the theory of liquid helium II: first, that the velocity of second sound in liquid helium II below 1° K does not approach zero at the absolute zero, but instead increases with decreasing temperature; second, that the thermal Rayleigh disk can be used to demonstrate and investigate the flow of normal and superfluid liquid helium past each other. These difficult experiments resolved an international controversy between theoretical predictions that were diametrically opposed.

On July 1, **E. Hugh Luckey** will assume the position of dean of the Cornell University Medical College in New York City. He has been affiliated with the College since 1944 and has directed the Cornell Medical Division of the Bellevue Hospital Center since 1950. Cornell Medical College is joined with the New York Hospital to form the New York Hospital-Cornell Medical Center. Dr. Luckey succeeds **Joseph C. Hinsey,** who became director of the Medical Center last July after 11 years in the deanship.

C. J. Mackenzie, member and past president of the National Research Council of Canada, has received the Kelvin Gold Medal for 1953. This medal, established in 1914 as a memorial to Lord Kelvin, is awarded triennially by the presidents of the principal engineering institutions in Great Britain on recommendations received from engineering societies in all parts of the world. Dr. Mackenzie is the first Canadian in a list of winners that includes Marconi and Whittle.

Donald H. Menzel, professor of astronomy at Harvard University and associate director for solar research, has been appointed director of the Harvard College Observatory. He succeeds Harlow Shapley, who retired in the summer of 1952.

Facilities that fall under Dr. Menzel's supervision include the Cambridge Observatory; the George R. Agassiz Station at Harvard, Mass.; the High Altitude Observatory which operates in cooperation with the University of Colorado at Climax, Colo.; the Upper Air Research Station at Sacramento Peak, Sunspot, N.M.; and a pair of stations for observation of meteors near Las Cruces, N.M. Since 1926 the Harvard Observatory has also operated the Boyden Station in South Africa, but it is expected that this station will shortly be transferred to other management.

Edwards Albert Park, at present in the Department of Pathology at The Johns Hopkins University and for 19 yr head of the Department of Pediatrics, has been awarded the New York Academy of Medicine Medal. He was cited for being "one of the true leaders in science of our times." Dr. Park is an authority on bone diseases.

George T. Perkins, has been assigned to Walter Reed Army Medical Center, Washington, D.C., as director of the Dental Division, Army Medical Service Graduate School. Since 1950 Colonel Perkins has been dental surgeon at Percy Jones Army Hospital, Battle Creek, Mich.

In February, Hans Pettersson of the University of California's Scripps Institution of Oceanography, presented the Albatross Medal of the Swedish Royal Society of Science and Letters to **Roger Revelle,** director of the Scripps Institution, for "his outstanding achievements in oceanography and especially in deep-sea research." The medal commemorates the Swedish deep-sea expedition of 1947–48 that Prof. Pettersson led.

In January **Stephen Rothman,** professor and head of the Section of Dermatology and Syphilology, School of Medicine, University of Chicago, gave the Sigmund Pollitzer Lecture at New York University—Post-Graduate Medical School.

The Société Nationale d'Acclimatation de France has granted the Isidore-Geoffroy-St-Hilaire Medal for 1952 to **Jacques Rousseau,** director of the Montreal Botanical Garden, in recognition of "his activity for the protection of nature."

Howard A. Rusk, professor and chairman of the Department of Physical Medicine and Rehabilitation of New York University's College of Medicine and director of the Institute of Physical Medicine and Rehabilitation of the New York University-Bellevue Medical Center, has received the Save the Children Federation's fourth annual award "in recognition of distinguished and devoted service in the field of health and welfare for children."

The first Distinguished Service Award of Alpha Epsilon Delta, the national premedical honor society, has been presented to **Aura E. Severinghaus,** associate dean of the Faculty of Medicine, Columbia University, for his outstanding contributions to premedical education. Dr. Severinghaus has been a strong and constant advocate of a broad foundation of liberal preprofessional education for medical students. He served as chairman of the committee which has just completed the survey of preprofessional education that has been published under the title "Preparation for Medical Education in the Liberal Arts College."

The Wenner-Gren Foundation for Anthropological Research has awarded the 1953 Viking Fund awards, consisting of a gold medal and $1000, to the following three men:

T. Dale Stewart, curator of physical anthropology in the U.S. National Museum, Smithsonian Institution,

for achievement in the field of physical anthropology.

Melville J. Herskovits of Northwestern University, for his work in general anthropology.

Gordon R. Willey, formerly with the Smithsonian Institution but now professor of anthropology at Harvard University, for his accomplishments in archeology.

Carl O. Tongberg, formerly director of the Research Division of the Standard Oil Development Company's Esso Research Center, Linden, N.J., has been appointed to the post of coordinator of research and development on products. He will be responsible for the Company's world-wide activities in research and development of petroleum products.

The 1953 Research Corporation's $2500 prize has been presented to two Dutch physicists for work they did 28 yr ago. **George E. Uhlenbeck,** professor of physics at the University of Michigan, and **Samuel A. Goudsmit,** chairman of the Physics Department of the Brookhaven National Laboratory, joined forces as graduate students at the University of Leiden in 1925. There they worked out the theory that electrons spin in their orbits around the nucleus of the atom, a theory that has been cited as "a cornerstone of present atomic theory."

Education

The **amphitheatre at the Louisville General Hospital** has been completely renovated and its seating capacity has been increased to 400. It has been named the Fred W. Rankin Amphitheatre in honor of Dr. Rankin, who has been on the surgical staff of the University of Louisville for over 30 yr and professor of surgery since 1941.

The Council on Dental Education of the American Dental Association has announced **approval of dental internship or residency programs** in 14 additional hospitals. Graduate training programs for dentists have now been approved in 131 hospitals throughout the nation. The programs considered by the Council, which is the dental profession's accrediting agency, include training in such fields as oral surgery, radiology, restorative dentistry, periodontia (treatment of diseases of the gums), anesthesia, children's dentistry, and root canal therapy.

Harvard University has announced the establishment at the Harvard School of Public Health of the **Charles F. Wilinsky Lecture Fund** in honor of the retired executive director of the Beth Israel Hospital and former Deputy Health Commissioner of the City of Boston. Given by Dr. Wilinsky's children and grandchildren, the fund will be used to bring to the School the nation's leading hospital administrators to discuss the role of the hospital in public health.

Dr. Wilinsky has been invited to give the first Wilinsky Lecture; he will discuss "The relation of hospitals and health departments in tomorrow's world" on Apr. 28.

A **joint training program for medical technologists** has been arranged between the Memorial Hospital at Easton, Md., Inc., and Washington College, Chestertown. The cooperative educational program was made possible by the recent approval, by the Council on Medical Education and Hospitals, of a School of Medical Technology at the Memorial Hospital to be conducted under the direction of E. C. H. Schmidt, pathologist. The plan will permit students who have completed 3 yr of study at Washington College and fulfilled all general requirements for graduation, to transfer to Memorial Hospital for a 1-yr course of professional study in medical technology. Upon successful completion of the course at Easton, they will receive the baccalaureate degree at Washington College and will qualify for examination for registry with the American Society of Clinical Pathologists.

Ernest H. Huntress, director of the **Massachusetts Institute of Technology Summer Session,** has announced plans for 34 special programs, a series of professional conferences and symposia, and more than 100 courses to be given during the coming summer.

Boston College has announced a special two-week intensive course in **modern industrial spectroscopy** at Chestnut Hill, Boston, July 12–23. The course is particularly designed for chemists and physicists from industries in the process of installing spectrographic equipment. Information can be obtained from Prof. James J. Devlin, Physics Department, Boston College, Chestnut Hill 67, Boston, Mass.

The **Prather Lectures** of Harvard University will be given jointly by A. J. Kluyver of the University of Delft, Holland, and C. B. van Niel of Stanford University on Apr. 21–23, and 28–30. The general subject will be "The microbe's contribution to biology."

Indiana University's **program to improve high school chemistry** education through advanced training for teachers will be supported by the Standard Oil Foundation, Inc., of Chicago. Under the trial plan, the university has accepted a $1000 grant. It will supply fellowships for five high school teachers taking summer studies towards masters' degrees in teaching with a major in chemistry. Fellowship winners will be chosen by the university from Indiana teachers. Because the university will waive tuition and fees, the Foundation's contribution will be used for expenses of the fellows.

The experiment is an effort to help solve the shortage of qualified chemists. Many scientists blame the shortage on a lack of high school graduates with interest in or basic knowledge of chemistry; this, in turn, is caused by a dearth of adequately-trained science teachers.

Ragnar Granit, director of the Medicinska Nobelinstitutet, Neurofysiologiska Avdelningen in Stockholm, is to give the eight **Silliman Lectures** for 1954 at Yale University between Apr. 29 and May 7 under the general title, "Receptors and sensory perception."

The Lectures will be open to all those interested in neurophysiology, psychology, psychiatry, and related fields. This Silliman series will mark the 50th anniversary of those on "The Integrative Action of the Nervous System," given in the spring of 1940 by Sir Charles Sherrington.

In addition to three basic isotope techniques courses, three special courses will be included in the **summer program of the Special Training Division of the Oak Ridge Institute of Nuclear Studies.** A new offering of the Division is a 2-wk course in radioactivity designed for teachers in secondary schools and teachers colleges. This course, which begins on June 7, will consist of background lectures in physics and radioactivity, together with a demonstration of all experiments outlined in the recent Atomic Energy Commission booklet, "Laboratory Experiments with Radioisotopes." Emphasis throughout the course will be on the technique of using radioisotopes in classroom demonstrations and in laboratory work. As many as 60 individuals will be accepted for the course.

The Division will open a 1-wk advanced course in Applied Instrumentation beginning on June 28. This course will consist of a group of lectures on instrumentation techniques and demonstrations of modern instruments by technical representatives of the manufacturers. Each manufacturer will be asked to supply instruments and demonstrate techniques involved in a variety of radioisotope problems.

An advanced course in radioisotope applications in biochemistry will be held from Sept. 6 to 17. This is the second such course to be given by the Division. Application blanks and additional information on the courses may be obtained from the Special Training Division, Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.

Charles M. Pomerat, director of the Tissue Culture Laboratory of the University of Texas Medical Branch, Galveston, will be director of a special course in **tissue culture technique** to be offered under the auspices of the Tissue Culture Association in Cooperstown, N.Y., during July.

Grants, Fellowships, and Awards

The Vincent Memorial Hospital, the Gynecologic Service of the Massachusetts General Hospital, announces an **American Cancer Society Fellowship** in cancer research. Appointment is for 1 yr, beginning July 1. Further information can be obtained from Dr. Joe V. Meigs, Vincent Memorial Hospital, Fruit Street, Boston 14.

Announcement has been made of the **1955–56 awards under the Fulbright Act** for university lecturing or advanced research in Australia, Burma, Ceylon, India, New Zealand, the Philippines, Thailand, and the Union of South Africa. Information may be obtained from the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Ave., Washington 25, D.C. To insure consideration, *applications must be postmarked no later than Apr. 15.*

The Harvard School of Public Health will give postgraduate scholarships in amounts ranging up to $5000 to qualified candidates desiring to study at the School during the academic year 1954–55. Eligible for **Harvard School of Public Health Postgraduate Scholarships** are:

Psysicians, dentists, and veterinarians interested in preventive medicine and seeking training in one or more public health specialties leading to either a Master of Public Health or Doctor of Public Health degree.

Industrial physicians seeking training in industrial medicine leading to a Master of Industrial Health degree.

Public health nurses with a college degree and satisfactory field experience who wish additional public health training leading to a Master of Public Health degree.

Public health engineers seeking additional training and research experience in one or more public health specialties leading to either a Master of Science in Hygiene or Doctor of Science in Hygiene degree.

College graduates with academic experience in the natural sciences who desire training and research experience in one of the sciences related to public health and leading to either a Master of Science in Hygiene or Doctor of Science in Hygiene degree.

The deadline for filing scholarship applications is Apr. 30; winners will be announced June 1. Further information may be obtained by writing the Secretary, Harvard School of Public Health, 55 Shattuck St., Boston 15, Mass.

New York University has received capital gifts totaling $115,236.48 for **New York University-Bellevue Medical Center's Institute of Physical Medicine and Rehabilitation.** A contribution of $65,000 was made by the James Foundation of New York, Inc.; through the interest of Mrs. Bernard F. Gimble, an associate trustee of the Medical Center, an additional $25,000 was given by the Samuel H. Kress Foundation, and $25,236.48 was received from individual donors. The funds make it possible for the university to meet the final construetion costs for the Institute of Physical Medicine and Rehabilitation, which was opened in January 1951.

The **Raskob Foundation for Catholic Activities** has awarded **Georgetown University** a grant of $125,000. The award, to be matched with an additional $75,000 raised by the university, is to be used over a 4-yr period to further medical education and Catholic medical activities. Part of the funds will be used to support the education of medical students who plan to practice in rural areas. None of the money is to be used for construction purposes or to take the place of activities in the university's regular budget. Francis M. Forster, dean of the School of Medicine, is chair-

man of an advisory committee set up to aid in the best utilization of the grant.

A special scroll award for outstanding contribution to medical education has been presented to **Smith, Kline & French Laboratories** of Philadelphia by the Michigan State Medical Society in Detroit. The award, made at the recent Michigan Clinical Institute, was given to the pharmaceutical firm "in appreciation and recognition of its pioneering contribution" to postgraduate medical teaching through the medium of color television. The Michigan Clinical Institute is the 55th medical meeting since June 1949 at which SK&F has telecast clinics and operations direct from hospital to assembly hall over its closed-circuit color system.

Meetings and Elections

The **Alabama Academy of Science** will hold its 31st annual meeting at Huntingdon College, Montgomery, Apr. 2–3.

The 65th meeting of the **American Chemical Society's Division of Rubber Chemistry** will be held in Louisville, Ky., Apr. 14–16. Dynamic tests that indicate a rubber compound's ability to withstand mechanical fatigue, weathering, and roadwear, and chemical advances that give added strength to oil-extended rubber, silicone rubber, and neoprene will be reported in 19 technical papers. Fred C. Wagner of the Du Pont Company's Louisville neoprene plant has been named general chairman of the meeting.

The 30th annual meeting and a clinical scientific program of the **American Heart Association** will be held in Chicago, Mar. 29–Apr. 4. Board and committee members, staff members, and other lay and medical representatives of affiliate and chapter heart associations in all parts of the country will attend a series of business meetings and heart program discussions. The week will be climaxed by a two-day cientific program of the Association's newly formed Section on Clinical Cardiology. The regular scientific sessions, hitherto held in conjunction with the annual meeting, have been combined this year with the Second World Congress of Cardiology which will convene in Washington, D.C., Sept. 12–17.

The **4th Annual Wildflower Pilgrimage** is to be held in the Great Smokies, Apr. 29–May 1. It is sponsored by the University of Tennessee Department of Botany and the Gatlinburg (Tenn.) Chamber of Commerce, with the cooperation of the naturalists in the National Park Service. Both amateur and professional botanists usually enjoy the Pilgrimage.

The **Association of American Geographers meetings,** Apr. 12–14, will have headquarters in the Penn-Sherwood Hotel, Philadelphia. W. F Christians of the University of Pennsylvania is chairman of local arrangements.

The **Baltimore Philosophical Forum** has been organized to promote a broadened concept of the Arts and Sciences by providing an opportunity to participate in the discussion of matters of philosophic interest. Donald J. Lovell is chairman for 1954.

A celebration meeting on **Paul Ehrlich's 100th Anniversary**—sponsored jointly by The New York Academy of Medicine, the Rudolf Virchow Medical Society in the City of New York, and the Medical Circle —was held in the New York Academy on Mar. 10. Several members of Paul Ehrlich's family participated in the meeting, and the following scientists spoke: Owsei Temkin of the Institute of the History of Medicine, The Johns Hopkins University; Ernst Jokl of the Valley Forge Heart Research Institute; and Cornelius P. Rhoads of Memorial Hospital.

The program of the **Congress of the International Society for Cell Biology** to be held at Leiden, Netherlands, Sept. 1–8 [*Science* **118**, 691 (Dec. 4, 1953)], will consist of twelve symposiums having the following chairmen and moderators: J. Monod, Institut Pasteur, Paris; S. Spiegelman, University of Illinois; G. C. Heringa, University of Amsterdam; A. Frey-Wyssling, Technische Hochschule, Zürich; J. D. Ebert, Indiana University; A. M. Schechtmann, University of California, Los Angeles; G. Pontecorvo, University of Glasgow; C. P. Leblond, McGill University; E. B. Astwood, New England Center Hospital, Boston; G. H. Hogeboom, National Institutes of Health, Bethesda; F. S. Sjöstrand, Karolinska Institutet, Stockholm; F. Zernicke, University of Groningen; H. G. Callan, University of St. Andrews; C. Barigozzi, Università, Milano; R. Latarjet, Institut du Radium, Paris; J. Holtfreter, University of Rochester; C. M. Pomerat, University of Texas; F. E. Lehman, Universität, Bern; H. Lettré, Universität, Heidelberg; H. H. Ussing, University of Copenhagen; W. H. Arisz, University of Groningen; R. W. G. Wyckoff, American Embassy, London; H. Fernandez-Morán, University of Caracas.

Each symposium will include, in addition to the main invitational addresses, six 15-min papers bearing on the particular subject, to be selected by the Dutch organizing committee from abstracts received during the coming weeks. *Abstracts (less than 300 words) should be sent immediately* to the secretary of the Dutch committee, Dr. W. H. K. Karstens, Botanical Laboratory, University, Leiden, Netherlands. One change in plan is that there will be a separate section for "free" 10-min papers which will meet concurrently with symposiums. Papers submitted for the symposiums, but failing to be selected for oral presentation, will be read by title or may be given at the free sessions. Three of the symposiums will be held under the auspices of the International Union of Biological Sciences as a conference on the "Fine Structure of Cells." Contributors to these sessions will have to furnish, besides the advance abstracts mentioned before, manuscripts of their papers to be published by IUBS in the proceedings of the conference.

A visiting group of **French consulting engineers** arriving in this country at the beginning of April will meet with a representative group of the members of the Association of Consulting Chemists and Chemical Engineers, Inc., at a luncheon in New York City on Apr. 7. The purpose of the gathering is to establish firmer contacts between American consultants and their foreign colleagues. The meeting is sponsored by the Foreign Operations Administration, Industrial Technical Assistance Division.

The **Fourth Middle East Medical Assembly** will be held at the American University Medical School in Beirut, Lebanon, on April 9–11. Distinguished speakers from the Arab States, England, and the United States will participate, including Sir Lionel Whitby, General Sam Seeley, Prof. John McMichael, and members of U.S. Army, Air Corps, and Navy Medical Corps. Subjects of especial interest to the region will be discussed. There will be scientific exhibits. The assembly is under the direction of Dr. Hobart A. Reimann.

Under the sponsorship of the National Research Council's Advisory Board on Quartermaster Research and Development, a symposium on **methods for evaluating nutritional adequacy and status** was conducted on Feb. 25–26 at the Oriental Institute, University of Chicago. The symposium was conducted jointly by the Quartermaster Food and Container Institute for the Armed Forces and the Medical Nutrition Laboratory, Office of the Surgeon General. The program was keyed to methods for evaluating: protein, vitamin, and mineral adequacy, respectively; military rations by use of test animals; and the nutritional status of of populations. Concluding the sessions, a round-table discussion was held on body composition in relation to metabolic regulations and activities.

The subject matter of the symposium was organized by Harry Spector, chief of the Nutrition Division, QMFCI, with the assistance of Lt. Col. C. J. Koehn, Medical Service Liaison Officer of the Institute; Lt. Col. Robert Ryer, III, commandant, and Theodore Friedemann, scientific director of the Medical Nutrition Laboratory, Office of the Surgeon General, coordinated the planning with regard to the interests of their organization.

Participants in the conference included nutritionists and medical scientists from the Armed Forces and from research institutions in the United States and Canada.

This year the annual meeting of the **North Dakota Academy of Science** will be held on the campus of the North Dakota Agricultural College at Fargo, May 7–8. The Academy will award cash prizes for the three best papers written by students, graduate or undergraduate, in any branch of science but representing, at least in part, some original work. The prize money is the gift of A. Rodger Denison, vice president of Amerada Petroleum Corporation.

The first organizational meeting of the **Society of Nuclear Medicine** was held in Spokane, Wash., Jan. 23. Twelve representatives from various areas in the Pacific Northwest were present and elected an executive committee composed of: pres., Thomas Carlile; pres.-elect., Asa Seeds; sec., Rex Huff; and treas., Norman Holter. The first annual meeting is scheduled for May 29–30, at the Benjamin Franklin Hotel in Seattle, Wash. The purpose of this new organization is to promote discussion and communication of knowledge related to nuclear phenomena, as they apply or are likely to apply to the understanding and control of disease. Abstracts for presentation at the first annual meeting may be sent to William H. Hannah, RR 2, Box 896, Bremerton, Wash. Those interested in becoming charter members should make application to Milo Harris, 252 Paulsen Bldg., Spokane, Wash.

The Institute of Industrial Health of the University of Cincinnati announces a **Symposium on Fluorides** to be presented on May 10–12 by the Kettering Laboratory in the Department of Preventive Medicine and Industrial Health. The symposium will be conducted by staff members of the Kettering Laboratory and a number of guest lecturers whose work in the field is contemporary. It will be open to physicians in industry and public health and to other professional persons who are interested in the problem of fluorides. The program has been divided into three daily sessions of talks and discussions on inorganic and organic fluorides, their biological effects on plants, animals, and man, and the associated problems of atmospheric control. Consideration will also be given to legal and economic aspects.

Interested persons should write to the Secretary, Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio. There will be a registration fee. Early application is advised since attendance will be limited.

Miscellaneous

The first issue of the ***ISA Journal,*** official publication of the Instrument Society of America, appeared in January. Robert J. Jeffries of Michigan State College is editor. Offices for the new monthly are at 1319 Allegheny Ave., Pittsburgh 33, Pa.

The Gerontological Society, Inc. has announced publication of a quarterly to be known as the ***Newsletter of the Gerontological Society.*** It will have an initial circulation of approximately 2000 copies. The submission of items for inclusion in the *Newsletter* is invited. These should be sent to Dr. Oscar J. Kaplan, San Diego State College, San Diego 15, Calif.

The National Manpower Council has published a six-point program for more effective utilization of America's scientific and professional manpower resources which would bring significant changes in the function, training, and income patterns of engineers, medical personnel, and teachers. This program repre-

sents the thinking of 66 national leaders in the engineering, medical, educational, scientific, industrial, governmental, and military fields who were called together in conference by the Council last fall. The proceedings of the conference, a 200-page book entitled, ***The Utilization of Scientific and Professional Manpower,*** has recently been published by the Columbia University Press.

The following **chemicals** are wanted by the Registry of Rare Chemicals, Armour Research Foundation of Illinois Institute of Technology, 35 W. 33 St., Chicago, Ill.: hafnium carbide; decaborane; trimethylaminoborine; tributylphosphine oxide; chromium hexacarbonyl; molybdenum oxyfluoride; 10-methyl-1,2-benzanthracene; 2-methyl-2-hexanol; N-methylpiperidine; cycloheximid; cyclohexanone peroxide; tetramethyl-p-benzoquinone; N,N,N′,N′-tetramethylethylenediamine; n-decanesulfonic acid; disodium methylarsinate; quinquiphenyl; ptyalin; peroxidase; lycopene; carbonic anhydrase.

Necrology

Douglas S. Anderson, 82, former dean of the College of Engineering and retired president of Tulane University, New Orleans, La., Mar. 2; **Sanford D. Ashford,** 55, engineer for the Interstate Commerce Commission, Washington, D.C., Feb. 9; **Joseph H. Barach,** 71, authority on diabetes and medical director of the Falk Clinic, Pittsburgh, Pa., Mar. 7; **Edwin I. Bartlett,** 70, associate professor of surgery and pathology at the University of California Hospital, San Francisco, Calif., Feb. 22; **Samuel A. Blan,** 82, research chemist, Brooklyn, N.Y., Feb. 17; **Stanley W. Bromley,** 54, retired chief entomologist for the Bartlett Tree Research Company, Stamford, Conn., Feb. 16; **B. Lucien Brun,** 70, retired head of the Dental Department at the Johns Hopkins Hospital, Baltimore, Md., Feb. 19; **Ralph Butler,** 80, former professor of laryngology and vice dean of otolaryngology in the Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa., Mar. 3; **Theodore Cohen,** 58, former president of the New York Academy of Optometry, author, and lecturer at the Optometric Foundation of New York, New York City, Feb. 12; **Julian Lowell Coolidge,** 80, former president of the Mathematical Association of America, author, and professor emeritus of mathematics at Harvard University, Cambridge, Mass, Mar. 5; **Otto P. H. Diels,** 78, Nobel chemist and professor emeritus of chemistry at the University of Kiel, Kiel, Germany, Mar. 7; **Eleazer J. Dole,** 66, professor of botany at the University of Vermont, Burlington, Vt., Feb. 22.

Otto P. Geier, 79, leader in industrial medicine and public health, Cincinnati, Ohio, Feb. 28; **Edward L. Getchell,** 69, professor emeritus and former head of the Mechanical Engineering Department at the University of New Hampshire, Durham, N.H., Feb. 23; **Evert Gorter,** 72, professor emeritus of pediatrics at Leyden University, Leyden, The Netherlands, Feb. 17; **James B. Herrick,** 92, heart specialist, author, and professor emeritus at Rush Medical College, Chicago, Ill., Mar. 7; **Fred H. Hillman,** 90, botanist, author, and retired seed expert for the Department of Agriculture, Washington, D.C., Feb. 8; **Ludwik Hirszfeld,** 69, serologist and professor of microbiology at Wroclaw University, Wroclaw, Poland, Mar. 7; **Frederick Holborn,** 61, project engineer at the research laboratory of the National Union Radio Corp., Orange, N.J., Feb. 11; **Kotaro Honda,** 83, research metallurgist, Tokyo, Japan, Feb. 12; **Walter R. Jones,** 51, professor of electrical engineering at Cornell University, Ithaca, N.Y., Mar. 8; **Edwin F. Kingsbury,** 67, electrical engineer and inventor for the Bell Telephone Laboratories, Murray Hill, N.J., Mar. 4; **Howard B. Lewis,** 66, research biochemist, author, and chairman of the Biological Chemistry Department at the University of Michigan Medical School, Ann Arbor, Mich., Mar 7; **Egon K. Lorenz,** 62 radiation specialist for the National Cancer Institute, Bethesda, Md., Feb. 12.

Louis Mark, 61, tuberculosis specialist, Columbus, Ohio, Feb. 25; **Charles L. Marlatt,** 90, retired chief of the Bureaus of Entomology and Plant Quarantine, Department of Agriculture, Washington, D.C., Mar. 3; **David Milne,** 77, botanist, Brechin, Scotland, Feb. 15; **John H. Mueller,** 62, professor and head of the Department of Bacteriology and Immunology at the Harvard Medical School, Boston, Mass., Feb. 16; **Arthur Palmer,** 64, author and professor of clinical surgery in the Department of Otolaryngology at the Cornell Medical College, New York City, Feb. 18; **Charles L. Parsons,** 86, former secretary of the American Chemical Society, chief chemist of the Bureau of Mines, and chief engineer of the War Department, Pocasset, Mass., Feb. 13; **James C. Peebles,** 77, dean emeritus of the School of Engineering at the Illinois Institute of Technology, Chicago, Ill., Feb. 18; **Frank R. Pratt,** 77, retired professor of physics at Rutgers University, New Brunswick, N.J., Feb. 25; **William H. Robey,** 83, cardiologist, author, former president of the American Heart Association, and former clinical professor of medicine at the Harvard Medical School, Boston, Mass., Feb. 23; **Walter C. Russell,** 61, professor of agricultural biochemistry in the College of Agriculture and dean of the Graduate School at Rutgers University, New Brunswick, N.J., Mar. 10; **George A. Stinchcomb,** 60, head of the Department of Physics at Heidelberg College, Tiffin, Ohio, Nov. 17; **C. M. Tucker,** 57, professor of botany and plant pathology and chairman of the Department of Botany at the University of Missouri, Columbia, Mo., Feb. 3; **Edwin F. Voigt,** 59, bacteriologist with Lederle Laboratories, Pearl River, N.Y., Feb. 15; **Felix von Oefele,** 92, research chemist, author, and authority on hieroglyphics, New York City, Mar. 9; **Wayland D. Wilcox,** 78, editor and specialist in scientific publishing, Philadelphia, Pa., Mar. 9; **Guy H. Woollett,** 66, research chemist and retired professor of chemistry at the University of Mississippi School of Medicine, University, Miss., Feb. 27.