Joseph Oscar Wilhelm: 1899-1953

W. J. Mackey

Research Council of Ontario, Toronto 5, Canada

JOSEPH OSCAR WILHELM, O.B.E., B.Sc., M.A., Director of the Research Council of Ontario, died in Toronto General Hospital on November 19, 1953, after a short illness. His death at the age of 54 cut short a distinguished career.

Professor Wilhelm was born in Shakespeare, Ontario. Educated at the University of Saskatchewan and the University of Toronto, he lectured in the physics department of the latter university from 1927 to 1948. He served, on leave of absence in World War II, as technical assistant to the president of Research Enterprises Limited, with the National Research Council of Canada, with the R.C.A.F. as director of Operational Research, and with the federal Department of Reconstruction.

Following the war he was secretary of the Ontario Research Commission, 1945–48. Their work resulted in the establishment of the Research Council of Ontario. As director for the Council since 1948, his energy and ability were largely responsible for the organization of more than 250 representatives of industry, government, and universities in various research committees concerned with technical problems affecting Ontario's natural resources and the supply of scientists. In this work his deepest faith lay in new generations of students whose possibilities inspired his efforts.

In addition to many other affiliations, both with community organizations and professional groups, he was first vice-president of the Royal Canadian Institute and chairman of the board of Knox Theological College, Toronto. He was well known to many scientists in Britain and the United States. A recognized authority on low temperature physics, he was equally at home with men and ideas. His bent for organization sprang from his imaginative grasp of problems outside his own field, his fresh and stimulating spirit, and his capacity for friendship. Always willing to attempt the difficult, he was devoted to the public welfare. His early death was a shock to his many colleagues and friends, a distinct loss to Canada and the community in which he lived.

In 1927 Professor Wilhelm married Nan Kathleen Munro of Saskatoon. He is survived by his widow, a son Donald who is at present in England, and a daughter Mildred, who is now attending high school.

News and Notes

High Polymer Chemistry

THE Fifth Canadian High Polymer Forum, cosponsored by the Chemical Institute of Canada and the National Research Council of Canada, was held in London, Ontario, Nov. 19–20, 1953. Papers were presented on all phases of high polymer chemistry.

Polymerization reactions revealed a continued trend to more basic investigations. A. D. Macallum described the preparation of phenylene monosulfide copolymer resins from *p*-dichlorobenzene or trichlorobenzene by fusion with sodium carbonate and sulfur. W. F. Graydon has found differences in equilibrium quotient between ion-exchange resins prepared by sulfonating cross-linked polystyrene and hydrolysis of esters of *p*-styrene sulfonic acid of equivalent nominal cross-linking and capacity. C. G. Overberger described the recent work on polymerization of styrene using stannic chloride catalyst in solvents such as carbon tetrachloride or nitrobenzene and concluded that it was possible to assign a nucleophilicity factor for attack of an ion pair on an aromatic nucleus. M. Talat-Erben has found an intermediate in the decomposition of 2,2′-azobisisobutyronitrile and has isolated products which could arise from this intermediate. The mechanism of the reaction is suggested to be scission of the nitrile to yield the intermediate and hydrolysis of the intermediate to yield such products as *N*-isobutyryl alpha amino isobutyric acid and the corresponding amide. D. James described the polymerization of acrylonitrile in aqueous solution, using hydrogen atoms or hydroxyl radicals formed photochemically from dissolved inorganic ions. L. Gendron described the method of determining the relative amounts of 1,2 and 1,4 addition in butadiene polymerization for forming the dimer in dilute chloroform solution with acetyl peroxide as initiator, followed by infra-red analysis and ozonolysis of the mixed dimers.

Properties of solutions of polymers continue to be of great interest to high polymer chemists. U. P. Strauss found that the viscosity of a polysoap solution, such as quaternized polyvinyl pyridine in solution, varied with the type of hydrocarbon being solubilized. These changes were interpreted as caused by changes in the size of the micelles and to interaction of the polysoap molecules. L. H. Cragg reviewed the significance of the viscosity slope constant in revealing the changes in branching of polystyrene and butadiene-styrene copolymers and other differences of the

structure of the polymer molecule and its configuration in solution. R. B. MacFarlane found that, for high molecular weight butadiene-styrene copolymers, the viscosity constants in dilute solution may require a quadratic term in concentration when the Mead equation is used, whereas the Huggin's equation is adequate in its usual form. R. Simha described a theory of adsorption of high polymers from solution and showed that the resulting isotherm should differ from a Langmuir isotherm in several respects. R. F. Boyer described the experiments on the viscosity of extremely dilute solutions of polystyrene in which the specific viscosity/concentration versus concentration goes through a maximum. The explanation lies in the expansion of the molecule in solution free from interaction with other molecules. S. H. Maron described light-scattering studies on pure liquids and polymer solutions, from which he concluded that the absolute Rayleigh scattering was in good agreement with published data as well as with the predictions of the Einstein equation for the scattering of pure liquids. M. Rinfret measured the heats of mixing and dilution of polyvinyl acetate and polystyrene solutions and in that way was able to classify solvents according to their effectiveness.

Properties of polymers were studied mostly with respect to the effect of applied stresses. Fensom has interpreted the changes in the reading on a Mooney instrument in terms of the structure of the rubber molecules and their entanglement. D. G. Ivey has found two linear curves in his study of stress-temperature-time phenomena through the second-order transition region and suggested that the intersection might be used to define the transition temperature for the process. D. G. Ivey has also measured dynamic shear modulus in solid rubber at ultrasonic frequencies and found that the preliminary data agree with those obtained from the bulk wave data on the basis of some assumptions. H. L. Williams reported that the contact angle of films of rubber varied with the amount of emulsifier relative to the amount of polymer but in particular with the amount of acrylonitrile comonomer in the polymer. K. B. Goldblum found that it was possible to measure the heat of combustion of organosilicon compounds and polymers and arrived at the conclusion that the Kharasch type heat of combustion per electron of the silicon to carbon bond was 39.1 kcal for alkyl substituted and 33.3 kcal for aryl substituted compounds. E. L. Falconer described the results of reacting the methylated cellulose dinitrate, prepared from cellulose trinitrate and hydroxylamine in pyridine, with ammonium hydrosulfide to yield a 1.1 methylated cellulose. Upon hydrolysis, this yielded mostly 2-methyl glucose.

Papers most specifically aimed at degradation of high polymers concluded the scientific sessions. C. Sivertz described the oxidative degradation of polymers initiated by the thermal decomposition of azobisisobutyronitrile in solution in a sealed viscometer. By this technique he was able to estimate the energy of activation of the over-all reaction and the reaction leading to chain scission as well as to measure the effectiveness of antioxidants. L. A. Wall has extended the studies on degradation of polymers by using deuterated polymers, from which he concludes that the transfer step in the reaction mechanism is important and that both this step and the depropagation step may exhibit isotope effects. C. R. Masson has measured the rate constants for degradation of carrageenin and found a low-temperature rapid reaction accompanied by an increase in sulfate content and reaction above 60° C, which was first order and was represented by an energy of activation of 29.5 kcal.

Following the forum dinner, D. P. Riley spoke on the structure and interaction of biological macromolecules, particularly with relation to the organization necessary for life and how the known mechanism of reactions could account for organisms and life.

The executives chosen for the next forum, to be held early in 1955, are R. V. V. Nicholls, chairman, H. Leverne Williams, program, and D. G. Ivey, secretary-treasurer.

H. Leverne Williams
Polymer Corporation Limited
Sarnia, Canada

Meeting of the American Institute of Electrical Engineers

The importance of the engineer was stressed by Elgin B. Robertson, president of the American Institute of Electrical Engineers, at the opening session of the five-day Fall General Meeting of the Institute. "The average person has no conception of the part played by engineers in those things with which the average person comes into daily contact," Mr. Robertson told the approximately 1000 engineers and scientists from all over the country.

During the 25 sessions the engineers listened to and discussed the latest advancements in the fields of switchgear, communications switching systems, feedback control systems, electrical techniques in medicine and biology, safety, industrial power systems, petroleum pipe lines, aural and television broadcasting management, petroleum production and refining, electrical developments in eastern and western mining, transmission and distribution, radio communication systems, cathodic protection, power generation, computing devices, transformers and protective devices, and system engineering.

In the technical sessions, G. L. Bush, of Teleregister Laboratories, New York, described the use of small selenium rectifiers in operation of a stock exchange quotation system, by which stock prices can be obtained by dialing a number. Prices are stored on a magnetic drum and relayed by telephone.

W. R. Wilson, of General Electric Co., described exhaustive tests made on electrical contacts. Approximately 15,000,000 tests were made of 750 silver contact pairs, such as those used in refrigerators, ranges, and other household devices, to determine the point of failure.

A new automatic method for testing telephone switching equipment was described by A. N. Hanson, Western Electric Co., Chicago. A new device, known as the Universal Equipment Test set, eliminates undesirable features of manual testing, but retains complete flexibility.

Ralph J. Osborn, Sinclair Pipe Line Co. engineer, predicted that remote automatic control of large pipeline pumping stations would be even more widely used in the future. The unattended operation, however, places greater emphasis on the reliability, simplicity, and ruggedness of electrical equipment, he warned.

One of industry's newer devices, the mercury electric switch, has been put into "work clothes," and is now doing heavy industrial duty, Arthur L. Riche, vice president of Micro, a division of Minneapolis-Honeywell Regulator Co., said in a safety session. The switch, which, among other things, protects the housewife when she opens her washer, may be cast into a solid block inside a metal can, for rough operations.

Use of the "compandor," a tiny device for improvement in radio and telephone communications, was reported by F. S. Boxall and R. S. Caruthers of the Lenkurt Electric Co. The device has been used to reduce noise and cross talk on open wire telephone systems for some time, but now also is used in cable and open wire carrier systems. The compandor they described "differs from any previously developed in being smaller, more compact, and using fewer vacuum tubes." It may be used in FM radio systems, VHF and microwave bands, carrier systems, in established systems that have deteriorated, and in railroad and pipeline circuits to improve their performance, they said.

An experimental microwave system on the Santa Fe Railroad that reduces communications distance between Galveston and Beaumont, Tex., from 315 to 70 miles, was reported by L. R. Thomas of the Atchison, Topeka, and Santa Fe Railroad. The new system spans Galveston Bay and replaces overland telephone and telegraph circuits that linked the two places.

"Radio has truly become one of the indispensable tools in the petroleum industry's never-ceasing struggle to supply the products that make possible our industrial civilization," W. M. Rust, Jr. of the Humble Oil Co. told a petroleum session, in describing the National Petroleum Radio Frequency Coordinating Association in the South and Southwest. Radio is vital to exploration geophysics, drilling, control of pipeline operations, tanker operation and marketing, he said.

When ice and sleet cover the countryside, the electrical engineer has a vital job keeping distribution lines open, O. L. Oehlwein, Public Service Co., Chicago, reported. He can take lines out of service and de-ice them by overloading, or he can utilize a relatively new procedure, angular displacement of the voltages to circulate sufficient current to heat conductors and melt ice on the lines. "This method," Mr. Oehlwein said, "holds great promise for those long, lightly loaded lines in the modern and lower voltage class which so often fall prey to these storms."

Science News

In an article in the Feb. 27 *Saturday Review* on the late **Edwin H. Armstrong,** radio engineer whose tragic death occurred on Feb. 1, R. D. Darrell said:

> As it is, the premature death of a man like Armstrong has for many of us the poignance of an irreparable personal loss, and should have for many more the impact of a general contemporary tragedy. Another of my few true heroes who still live, H. M. Tomlinson, best expressed my present feelings, when he wrote after the death of Conrad, "Once we were so assured of the opulence and spiritual vitality of mankind that the loss of a notable figure did not seem to leave us any the poorer. But today, when it happens, we feel a distinct diminution of light."
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> The question becomes ever more pressing: Can we afford the loss of such too-seldom replenished light in a world of gathering darkness?

The following excerpts concerning the **Arnold Arboretum of Harvard University** are taken from a letter to the *Harvard Alumni Bulletin* (Dec. 12, 1953) from John S. Ames, president of the Massachusetts Horticultural Society; Grenville Clark, lawyer and a former member of the Harvard Corporation; and Ellery Sedgwick, former editor of the *Atlantic Monthly.*

> There has recently been filed with the Supreme Judicial Court of Massachusetts a lawsuit relating to the Arnold Arboretum which may be of consequence in Harvard's history. The ten petitioners . . . represent a not inconsiderable body of devoted friends of the Arboretum and the College. . . .
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> The relief sought is a review of a decision by an Assistant Attorney General of Massachusetts refusing permission for a test suit in the Attorney General's name to determine whether the plan set forth in a vote of the Harvard Corporation on January 19, 1953 would involve a breach of Harvard's obligation as trustee for the Arboretum. Having itself refused to apply to the courts for advice, the Corporation also opposed the petitioners' application to bring a test suit in the Attorney General's name, which is the usual and perhaps only method to obtain a judicial ruling in such a case. . . .
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> The Corporation's vote of January 19, 1953 concedes that the Arboretum's funds and other property are held by the Corporation under a special trust to be administered in the best interests of the Arboretum. Nevertheless, this same vote calls for the removal from the Arboretum at Jamaica Plain to the new Botanical Building in Cambridge of the major part "related to research" of the Arboretum's remarkable library and almost unique herbarium. Since the herbarium and library are almost wholly "related to research," that phrase would hardly restrict the proposed removal at all, so that in practice the plan would doubtless result in the removal from the Arboretum to Cambridge of all but a small part of the library and herbarium. The vote also calls for the use of some of the Arboretum's endowment for maintenance of the new building and contains other features the legal validity of which is questioned.
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> While the Corporation asserts that this plan would be in the Arboretum's interest, the petitioners claim that, according to the overwhelming opinion of impartial authorities, the removal and other features of the plan would

be plainly detrimental to the Arboretum (whether or not it would benefit botany at Harvard) and would, consequently, constitute a breach of trust.

What the petitioners are now seeking is merely an opportunity to establish this claim by a judicial trial on the merits. The petition alleges that by its refusal to cooperate in obtaining a judicial ruling the Corporation has departed from the usual and proper practice of trustees. . . .

Never before in Harvard's history has the Corporation sought to avoid a judicial ruling as to the legality of its administration of trust funds where, as in this case, serious questions as to a possible breach of trust have been raised by responsible persons upon the advice of distinguished counsel. . . .

It is still open to the Corporation to cooperate in the submission of the legal issues for authoritative decision by the Massachusetts courts. With many others we still hope that the Corporation will listen to this earnest appeal that it shall cease to oppose a judicial test.

Development of a **microwave impedance bridge** by the Research Division of New York University's College of Engineering has been announced. The instrument permits rapid, precision measurement of impedance in the frequency range of 400–1600 megacycles. It eliminates the tedious, time-consuming, and costly impedance measurements now made with slotted-line technique. The instrument was developed under sponsorship of the Navy's Bureau of Ships in a project directed by David M. Goodman.

Stanford University's billion-volt, super-high-frequency, 200-foot-long electron linear accelerator is going to be made in junior sizes for cancer therapy and for the inspection of industrial products. The **"toned down" accelerators** will be manufactured and sold by the X-ray Department of General Electric Company under a 10-year agreement with the University. They should be on the market within the next few years.

Scientists in the News

The Institute of Metals, London, England, has awarded the following medals for 1954:

The Institute of Metals Medal to **Leslie Aitchison** in recognition of his services to metallurgy in industry, in education, and in public service.

The Rosenhain Medal to **Alan Howard Cottrell,** professor of physical metallurgy, University of Birmingham, in recognition of his contributions to the field of physical metallurgy, with special reference to the deformation of metals.

F. G. Arndt, who is on leave of absence from his post as chairman of the Department of Chemistry at the University of Istanbul, is a visiting professor at Indiana University. In addition, he will give the Reilly Lectures at the University of Notre Dame and the Priestley Lectures at Pennsylvania State University this year.

The 1953 Glycerine Research Awards of the Glycerine Producers' Association are as follows:

First prize of $1000 and an honor plaque was presented to **Erich Baer** of the University of Toronto for having duplicated by synthetic methods a group of biological glycerol derivatives present in animal cells, liver, and brain tissues, but extremely difficult to isolate from these natural sources. His work has opened the door to further fundamental studies that will lead to increased knowledge of the way the body converts food into tissue constituents used for growth, repair, and energy.

Second prize, $300 and honor plaques, was shared by **Lewis I. Gidez** of the Brookhaven National Laboratory and **Manfred L. Karnovsky** of the Harvard University Medical School. They developed methods for incorporating radioactive carbon into glycerol and glycerides. They then administered these compounds to rats, and by means of the tagged carbon, traced the conversion of these materials into respiratory carbon dioxide, blood sugar, liver glycogen, and tissue lipides.

Albert C. Nuessle of Rohm and Haas Company, Philadelphia, and **Russell F. Crawford, Jr.,** of Sharon Hill, Pa., shared the third award of $200 and plaques. They found that a crisp, washfast finish could be imparted to nylon fabrics by reacting polyacrylic acid and glycerine with the surface molecules of the nylon.

Donald J. Belcher, director of the Cornell Center for Aerial Photographic Studies, has gone to Rangoon, Burma, to initiate a year-long program of aerial photographic training for Burmese nationals. With the support of the U.S. Foreign Operations Administration, the Burmese government has contracted with Cornell to train Burmese specialists to use aerial photographs in the fields of forestry, soils, urban and land planning, geology, and agriculture.

Ta Liang, of the Center's staff, will be field director in Burma for a major portion of the program; a visiting professor at Cornell, he served as a senior engineer with the U.S. Army during World War II and has been with the Center since its inception in 1950. Another member of the team is **T. M. Bushnell** of Purdue University, director of the Indiana Soils Survey, who has had wide experience in Japan and Central America. **Ernest Stoeckeler,** on leave from the U.S. Forest Service, will supervise the forestry division of the work.

Carl C. Chambers, dean of the Moore School of Electrical Engineering at the University of Pennsylvania, has been elected vice president of the University in charge of engineering affairs. He will be responsible for chemical, civil, mechanical, metallurgical, and electrical engineering education.

Allan Chilton, formerly with the Wright Aeronautical Division of Curtiss-Wright Corporation, has been appointed chief engineer for the Aviation Gas Turbine Division of the Westinghouse Electric Corporation.

Herschel H. Cudd has been appointed to the newly created position of manager of research and development by the American Viscose Corporation. Dr. Cudd has resigned as director of the Engineering Experi-

ment Station at Georgia Institute of Technology and will occupy his new post effective April 1.

John H. Davis will resign this spring as Assistant Secretary of Agriculture to become director of the Moffett Program in business and agriculture at the Harvard University Graduate School of Business Administration.

I. S. Falk, director of research and statistics in the Social Security Administration, has joined a mission being sent to Malaya and Singapore for 3 mo by the International Bank for Reconstruction and Development. The mission is surveying the economies of the two countries and making recommendations for long-range development. Mr. Falk will be the Advisor for Social Services (including health, education, welfare, and related activities). He is on leave of absence for this assignment, but will resign from his present position effective June 30.

In recognition of his outstanding contributions to the advancement of heating, ventilating, and air conditioning, **Walter L. Fleisher** of New York was the recipient of the F. Paul Anderson Medal for 1953, awarded by The American Society of Heating and Ventilating Engineers.

Henry T. Harrison, manager of weather service for United Air Lines, is the recipient of the Robert M. Losey Award for 1953, bestowed by the Institute of Aeronautical Sciences "in recognition of outstanding contributions to the science of meteorology as applied to aeronautics." Mr. Harrison has been engaged in aeronautical meterology since 1924. In 1928 he accompanied the Byrd Antarctic Expedition.

Molly R. Harrower, clinical psychologist of New York City and director of the research program of the Court Intake Project of the Family Relations Court of New York City, has accepted appointment as lecturer in clinical psychology at the University of Texas Medical Branch. Dr. Harrower will be in residence in Galveston for several weeks in February and March of each year. She will conduct special seminars and demonstrations illustrating the way in which clinical psychologists may cooperate in current medical problems.

Bernard L. Horecker of the National Institute of Arthritis and Metabolic Diseases and an authority on the chemistry of enzymes, has won the 1954 Hillebrand Award of the American Chemical Society's Washington Section.

Eugene J. Houdry of Ardmore, Pa., has been presented with the John Scott Medal Award—a medal, a scroll, and $1000—administered by the Philadelphia Engineers Club. Houdry was honored for his achievements in the catalytic cracking of petroleum. The cracking process that he originated reshaped the oil industry and at present is in almost universal use in the production of high octane gasoline.

Thomas W. Jackson, formerly aeronautical research engineer with the U.S. Air Force working at the Atomic Energy Commission in Washington, has been appointed head of the Mechanical Sciences Division of the Georgia Institute of Technology Engineering Experiment Station.

Creation of a Cornell Aeronautical Laboratory Professorship and the naming of **Mark Kac** of the Cornell University mathematics staff as first appointee have been announced by the university. The chair may be rotated among members of the faculty. The incumbent will spend approximately one month of the year at the laboratory, and the remainder in teaching and research on the campus. C.A.L., a self-sustaining subsidiary of the university, engages in military and industrial research. Last year it handled contracts with a total value of $9,200,000.

George G. Mallinson, professor of psychology and education at Western Michigan College, became director of the college's graduate division on Feb. 1.

In recognition of **Harrison E. Martland's** 46 years of public office and medical practice, the city of Newark, N.J., has dedicated its new $13,000,000 hospital, now under construction, as the Harrison E. Martland Medical Center. Dr. Martland, an authority on radioactive diseases, resigned recently after 25 yr as chief medical examiner of Essex County; he has been city pathologist for 45 yr.

It was a generation before atomic fission that Dr. Martland first encountered symptoms of radioactive poisoning among women who worked in a watch factory. Several died and autopsies evolved a new pathological pattern. In applying luminous paint to dials, the women had absorbed minute doses of radioactive materials by touching paint brushes to their lips. When the Manhattan Project was started during World War II, Dr. Martland was appointed to outline the requirements for protection of employees at the Oak Ridge plant.

An instructor in forensic medicine for many years at New York University, Dr. Martland is a past president of the New York Pathological Society and a former president of the New Jersey and Essex County Medical Societies. In 1939 the New Jersey Pathological Society established in his honor an annual Harrison E. Martland Medical Lecture. Three Noble Prize winners have been the lecturers in recent years.

J. Alex Munro, professor and chairman of the Department of Entomology at North Dakota Agricultural College, has resigned after 25 years of service in North Dakota. He has also served as Entomologist of the North Dakota Experiment Station, State Entomologist for North Dakota, and Collaborator for the Bureau of Entomology and Plant Quarantine of the U.S. Department of Agriculture. Dr. Munro is the author of approximately 150 articles and other publications dealing with economic entomology. For the past two years he has been on leave to act as research entomologist for the Point IV Program in Bolivia.

He is now continuing this assignment under the Foreign Agricultural Service of the U.S. Government.

The first annual Judson F. Swearingen Award for outstanding scientific research conducted at Southwest Research Institute has been won by **John P. O'Meara** and **William L. Rollwitz,** both of the Physics Department, for their "pioneer work in nuclear resonance at low magnetic field strengths."

Russell J. Seibert, director of the Los Angeles State and County Arboretum, Arcadia, Calif., has been appointed director of the recently created Department of Arboreta and Botanic Gardens for the County of Los Angeles.

Maurice M. Shapiro, head of the Cosmic Ray Branch of the Naval Research Laboratory, Washington, D.C., has been named superintendent of the Nucleonics Division of the Laboratory, succeeding **F. N. D. Kurie** who has become technical director of the U.S. Navy Electronics Laboratory in San Diego. Dr. Shapiro will continue to direct cosmic ray research.

Arthur W. Thomas has been designated as the 1954 recipient of the Henry Hurd Rusby Award. This award is given by the Alumni Association of the Columbia University College of Pharmacy in recognition of Prof. Thomas' contributions to the College program during the many years he served as Columbia University representative to the College, as an actively participating member of the Board of Trustees, and as the head of the University's Department of Chemistry.

Education

The University of New Mexico has announced that the 23rd annual **Field Sessions in Anthropology** will be held from June 16 through July 26. The emphasis of the sessions is on training in archaeological field work by specialists of experience in the southwestern area. For details, address Dr. Frank C. Hibben, University of New Mexico, Albuquerque, N.M.

The Ames Laboratory of the U.S. Atomic Energy Commission at Iowa State College, under the direction of F. H. Spedding, has completed construction of a **"hot canyon"** area for experiments in reprocessing atomic fuel for re-use in power reactors. This area, designed for handling fissionable materials and high level radioactivity, is located on the two lower floors of the Laboratory's Research Building.

Within the 60-by-28 ft canyon is the "hot cave," a trough 33 ft long in which the radioactive material is placed. Shielded from the "hot" material by an 8-in. steel wall 10 ft high, workers conduct experiments in the cave by means of remote-control devices sometimes called "master-slave manipulators." Lead glass windows permit operators to view their work. The wall is equipped with offset plugs through which the utilities can be led in to the experimental area. The canyon also has its own ventilating system to maintain a constant supply of fresh, uncontaminated air and to insure that only uncontaminated air is discharged to the atmosphere.

Some of the features of the canyon are similar to those found at other AEC installations where work with high-level radioactivity is in progress. Much of the equipment, however, is of a specialized nature and was specifically designed or adapted for the local work by Gordon Winders, a mechanical engineer on the Laboratory staff. Ray Fisher, group leader in charge of building and engineering services, directed the general design of the canyon. In direct charge of the experimental studies are Adolph Voigt, who oversees the radiochemical research, and Adrian Daane, who supervises the metallurgical aspects.

The special program in **infra-red spectroscopy** will be given during the 1954 Summer Session from July 19 to July 30 at the Massachusetts Institute of Technology. Offered jointly by the Institute's Spectroscopy Laboratory and Department of Chemistry, the program is designed for those who wish an introduction to infra-red instrumentation and laboratory methods and for those interested in the use of infra-red spectra in the solution of chemical problems.

There will be two integrated 1-wk courses, one on the technique of infra-red spectroscopy and the other, on the applications of infra-red spectroscopy under the direction of Richard C. Lord, director of the Spectroscopy Laboratory at MIT, and Foil A. Miller, in charge of the Spectroscopy Laboratory at the Mellon Institute of Industrial Research. Application forms and further information can be obtained from Dr. E. H. Huntress, Director of the Summer Session, Massachusetts Institute of Technology, Cambridge 39.

The Special Training Division of the Oak Ridge Institute of Nuclear Studies will offer three basic **isotope techniques courses** during the summer months. Starting dates of the 4-wk courses are June 14, July 12, and Aug. 9, 1954. The laboratories, counting room, and lecture room of the Special Training Division have been remodeled and enlarged, and the Institute's library will soon occupy new quarters recently added to the Training Building. Additional information on the courses may be obtained from the Special Training Division, P. O. Box 117, Oak Ridge, Tenn.

The **Jackson Hole Biological Research Station** will be available for use by research workers in the biological sciences from June 10 to Sept. 10, and at other times during the year by special arrangement. This Station, which is located at the foot of the Teton Mountains near Moran, Wyo., is administered by the University of Wyoming under agreement with the New York Zoological Society. Projects in basic ecology, taxonomy, and behavior are encouraged, and opportunities for research in the practical aspects of conservation, game management, and fisheries biology are also offered. Students may register for credit at the University of Wyoming for research projects undertaken at the Research Station. Facilities available include a laboratory, a library, and sleeping quarters. Inquiries should be addressed to L. Floyd Clarke, Department

of Zoology and Physiology, University of Wyoming, Laramie.

The Marine Laboratory of the University of Miami at Coral Gables, Fla. will offer two courses in the **marine sciences** in the six-weeks summer session, June 14–July 24: "Introduction to marine biology," and "Introduction to oceanography." Detailed information may be obtained from the Marine Laboratory or the Director of the Summer Sessions, Box 488, University of Miami, Coral Gables 46, Fla.

The Duke University Marine Laboratory at Beaufort, N.C. and the Mountain Lake Biological Station will offer courses in **radiation biology** during the summer of 1954. These courses will be implemented by visiting lecturers from the Biology Division of the Oak Ridge National Laboratory. From June 9 to July 17 there will be offered at Beaufort an introductory course dealing with the basic physical, chemical, and biological principles upon which study of the biological effects of radiation is based. Those interested should write to Dr. C. G. Bookhout, Director, Duke University Marine Laboratory, Durham, N.C.

A more specialized course which will emphasize the cytological and cytogenetic effects of radiation will be offered at the Mountain Lake Biological Station from July 22 to Aug. 25. For details address Dr. Bruce D. Reynolds, Director, Mountain Lake Biological Station, University of Virginia, Charlottesville, Va. These two courses have been so scheduled and integrated that both may be taken during the summer, or either may be taken as a separate course. Each course carries 6 semester hours credit.

St. John's University College of Pharmacy, Brooklyn, has announced the celebration of its 25th Anniversary on Apr. 24–25.

Correction: On p. 314 of the Mar. 5 issue, the item on the Marine Biological Laboratory at Woods Hole erroneously stated that Hewson Swift, recipient of this year's Frank R. Lillie Memorial Fellowship at the Laboratory, previously had been a director of MBL.

Grants, Fellowships, and Awards

As a contribution to the meeting of the British Association for the Advancement of Science to be held in Oxford on Sept. 1–8, 1954, Imperial Chemical Industries Limited, publishers of the quarterly scientific review *Endeavour,* have offered the sum of 100 guineas to be awarded as prizes for essays submitted on a scientific subject. As the primary purpose of these awards is to stimulate younger scientists to take an interest in the work of the British Association and to raise the literary standard of scientific writing, the competition is restricted to those whose 25th birthday falls on or after June 1, 1954. Five **Endeavour Prizes** will be awarded: a first prize of 50 guineas; a second prize of 25 guineas; a third prize of 15 guineas; and two special prizes of 5 guineas each for competitors who have not passed their 18th birthday on June 1. The subjects for the essays are: (1) The upper atmosphere; (2) Heat of the earth; (3) Coal as a raw material; (4) Water supply; (5) The span of life; (6) Color photography.

The essay must be in English and typewritten, and should not exceed 4000 words. It should be submitted without signature; the author's full name, address, and date of birth should be disclosed in a sealed covering letter attached to the essay. Only one entry is permitted from each competitor. Entries should be addressed, in an envelope clearly marked "Endeavour Prize Essay," to: The Assistant Secretary, British Association for the Advancement of Science, Burlington House, Piccadilly, London, W.1. *The latest date for receipt of entries is June 1, 1954.*

The essays will be judged by the editors of *Endeavour* in consultation with representatives of the British Association. The successful competitors will be invited to attend the whole of the Oxford meeting, at which the prizes will be presented, and their expenses within the United Kingdom will be paid. The judges' decision is final, and they reserve the right to withhold all or any of the prizes should no entries of sufficient merit be received.

The names of the contestants will not be disclosed to the judges until after the prize-winning essays have been selected. In judging the results, special attention will be paid to the originality of the approach to the subject and to literary style. The competitor's age will also be taken into account. The essay winning the first prize will be published in *Advancement of Science,* journal of the British Association.

The School of Biological Science at the University of Tennessee, Memphis, has announced the availability of **graduate fellowships in biochemistry** and lists the following information for applicants:

1. Teaching fellows are allowed half-time graduate residence credit during the fall, winter, and spring quarters. During these quarters fellows carry a teaching load of 6–9 hr/wk, generally in laboratory instructing or assisting.

2. Fellows may enroll on a full-time graduate credit basis during the summer quarters.

3. Normally teaching fellows will require six quarters to satisfy the requirements for an M.S. degree. The additional time necessary to qualify for the Ph.D. is less predictable, but may be shortened substantially by continuing the graduate program during the summer quarters.

4. Graduate students who major in biochemistry carry minors in anatomy and physiology.

5. Tuition fees, including fees for summer quarters, are remitted for teaching fellows. Salaries are paid in 10 equal monthly installments beginning with the month of September. Currently, the salary scale provides $1200 during the first and second years for candidates for the M.S. degree. Fellows who hold an M.S. and are candidates for the Ph.D. start at a salary of $1500 and receive annual increments up to a maximum annual salary of $2400.

The **National Science Foundation** has announced 100 grants totaling about $1,045,000 for research in the biological and the physical sciences, and to support studies and conferences on science, scientific information exchange, compilation of scientific personnel information, education in the sciences, and travel of American scientists to international scientific meetings. This is the second group of awards to be made during fiscal year 1954 by the Foundation. The duration of research grants in this group ranges from 1 to 5 yr, with an average length of 2.2 yr.

Harvard University. D. Hoffleit, Harvard Observatory. Variable stars in the Milky Way, 2 yr, $5500.

University of California, Berkeley. D. W. Mitchell, Inst. of Engineering Research. Structure of molten silicates by measurements of partial molar volumes, 1 yr, $3000.

University of Delaware. E. Dyer, Dept. of Chemistry. Effect of oxygen on vinyl compounds in the presence of free radicals, 18 mo, $10,000.

Georgia Institute of Technology. J. Hine, Dept. of Chemistry. Effect of halogen atoms on reactivity of other halogen atoms in the same molecule, 2 yr, $10,000.

Washington University. A. C. Wahl, Dept. of Chemistry. Kinetic studies of oxidation-reduction reactions, 2 yr, $17,700.

Macalester College, St. Paul, Minn. W. S. Glock, Dept. of Geology. Tree growth and climate, 3 yr, $13,000.

Columbia University. J. L. Kulp, Dept. of Geology. Time relations of ocean floor sediments, 1 yr, $13,000.

Harvard University. W. O. Roberts, High Altitude Observatory. Observational studies of solar activity, 1 yr, $10,000.

Washington University. J. C. Brice, Dept. of Geology. Pleistocene geology of northeastern Missouri, 2 yr, $3500.

Vassar College. G. E. Baker, Plant Science Dept. Microorganisms in lake water, 3 yr, $5300.

Lehigh University. A. C. Zettlemoyer, Dept. of Chemistry. Mixed vapor adsorption, 2 yr, $6200.

Louisiana State University. J. Coates, Dept. of Chemical Engineering. Thermal conductivity of liquids and solutions as a function of temperature, 2 yr, $13,800.

Northwestern University. A. B. Bronwell, Dept. of Electrical Engineering. Microwave conversion and detection, 1 yr, $5000.

South Dakota School of Mines and Technology. W. A. Hixson, Dept. of Electrical Engineering. Observable failures of electrically stressed transformer oil, 2 yr, $3500.

Brown University. J. Federer, Dept. of Mathematics. Theory of measure and area, 1 yr, $7000.

Institute for Advanced Study. H. Samelson, School of Mathematics. Topology of lie groups and spaces of paths, 1 yr, $9200.

Lehigh University. E. A. Pitcher, Dept. of Mathematics. Problems in critical point theory, 1 yr, $3000.

Princeton University. A. Church, Dept. of Mathematics. Preparation of results of basic research, 1 yr, $5600.

University of Alabama. W. Pigman, Dept. of Biochemistry. Biologically significant reactions and interactions of nitrogenous carbohydrates and related substances, 3 yr, $13,000.

University of California, Berkeley. H. K. Schachman and C. A. Dekker, Virus Laboratory. Mechanisms of enzymatic breakdown of proteins and nucleic acids, 3 yr, $25,000.

Chicago Medical School. A. R. Goldfarb, Dept. of Biochemistry. Structure and reactions of the peptide bond in aqueous solution as indicated by ultraviolet absorption spectra, 1 yr, $8000.

University of Chicago. L. Bogorad, Dept. of Botany. Enzymatic synthesis of porphyrins from porphobilinogen, 2 yr, $12,000.

Fordham University. F. F. Nord, Dept. of Organic Chemistry. Structural, biochemical, and physico-chemical studies of lignin, 3 yr, $21,000.

Harvard University. J. T. Edsall, Biological Laboratories. Physical chemistry of amino acids, peptides, and proteins with special reference to Raman spectra, 3 yr, $30,000.

Harvard University. L. F. Fieser, Dept. of Chemistry. Role of sterols in health and disease, 3 yr, $30,000.

Harvard University. A. F. Riggs, Biological Laboratories. Biochemistry of hemoglobin, 2 yr, $3500.

University of Illinois. I. C. Gunsalus, Dept. of Bacteriology. Biosynthesis and function of microbial chromoproteins, 2 yr, $11,000.

State University of Iowa. R. Benesch, Dept. of Biochemistry. Reactivity of sulfhydryl groups in peptides and proteins, 2 yr, $12,000.

Montana State College. J. H. Pepper, Dept. of Zoology and Entomology, and L. H. Johnson, Dept. of Chemistry Research. Composition and structure of the cuticular components of the exoskeleton of the Mormon cricket, 2 yr, $10,000.

University of Nebraska. H. Jehle, Dept. of Physics. Specific interactions of biological significance, 2 yr, $10,000.

Princeton University. E. N. Harvey, Dept. of Biology. Biochemistry of light production in the Ostracod crustacean, *Cypridina hilgendorfii*, 3 yr, $19,000.

Vanderbilt University. O. Touster, Dept. of Biochemistry. Origin and metabolic fate of *L*-Xylulose, 2 yr, $8000.

Western Reserve University. H. Z. Sable, Dept. of Biochemistry. Intermediary metabolism of nucleic acid fragments, 2 yr, $10,000.

Western Reserve University. J. B. Wittenberg, Dept. of Biochemistry. *In vitro* synthesis of sphinogosine, 2 yr, $3500.

Louisiana State University. J. M. Reynolds, Dept. of Physics. Electric and magnetic measurements on bismuth at low temperatures, 1 yr, $9800.

University of New Mexico. J. R. Green and V. H. Regener, Dept. of Physics. Collision cross sections for cosmic ray showers, 2 yr, $8900.

Western Reserve University. R. G. Winter, Dept. of Physics. Double beta decay, 1 yr, $7600.

University of California, Berkeley. D. A. Riley, Dept. of Psychology. Rote learning, 1 yr, $3400.

Duke University. G. A. Kimble, Dept. of Psychology. Avoidance learning, 2 yr, $6100.

Duke University. K. Zener, Dept. of Psychology. Visual perception of spatial relationships, 2 yr, $11,800.

State University of Iowa. D. Lewis, Dept. of Psychology. Perceptual-motor tasks, 2 yr, $11,700.

University of Missouri. M. H. Marx, Dept. of Psychology. Experimental analysis of food hoarding behavior, 2 yr, $8400.

Mount Holyoke College. J. Volkmann, Dept. of Psychology. Visual perception, 2 yr, $9800.

New York University. H. H. Kendler and T. S. Kendler, Dept. of Psychology. Problem-solving behavior, 2 yr, $14,100.

University of North Carolina. L. L. Thurstone, Psychometric Laboratory. Multiple factor analysis, 2 yr, $17,700.

Pennsylvania State College. J. H. Grosslight, Dept. of Psychology. Role of reinforcement in learning, 2 yr, $7600.

Syracuse University. W. R. McAllister and D. E. McAllister, Dept. of Psychology. Eyelid conditioning and generalization of the conditioned eyelid response, 2 yr, $12,300.

State College of Washington. F. A. Young, Dept. of Psychology. Systematic investigation of pupillary conditioning, 2 yr, $11,400.

University of California, Berkeley. C. H. Sawyer, Dept. of Anatomy. Hormonal control of enzyme synthesis, 3 yr, $6000.

University of California, Berkeley. P. K. Stumpf, Dept. of Plant Biochemistry. Oxidation of short chain fatty acids by plant extracts, 1 yr, $1050.

Columbia University. H. Elftman, Dept. of Anatomy. Cytochemical investigation of phospholipids, 2 yr, $9300.

Haskins Laboratories, New York City. L. Provasoli. Nutritional requirements of marine algae, 3 yr, $9000.

Michigan State College. H. M. Sell, Dept. of Agricultural Chemistry. Biochemistry of growth substances in corn pollen, 2 yr, $6900.

Northwestern University. C. L. Turner, Dept. of Biology. Hormonal control of growth and differentiation of regenerating tissue, 2 yr, $9000.

Princeton University. J. T. Bonner, Dept. of Biology. Differentiation of the amoeboid slime molds, 3 yr, $8800.

Childrens Hospital, Washington, D.C. S. P. Bessman, Research Foundation. Low energy transacylation in animal tissues, 2 yr, $15,000.

University of Tennessee. J. S. Davis, Division of Anatomy. Effects of accessory nutritional factors on the nucleic acids of uterine tissue, 2 yr, $9000.

Virginia Polytechnic Institute. K. W. King, Dept. of Biology. Mechanism of cellulose decomposition by aerobic bacteria, 2 yr, $6000.

Washington University. M. Cohn, Dept. of Microbiology. Induced enzyme and antibody synthesis, 3 yr, $22,500.

Washington University. A. Kornberg, Dept. of Microbiology. Enzymatic mechanisms in nucleic acid synthesis, 3 yr, $26,000.

Western Reserve University. E. W. Sutherland, Dept. of Pharmacology. Mechanism of action of epinephrine and related synpathomimetic amines, 3 yr, $22,750.

University of Wisconsin. G. W. Keitt, Dept. of Plant Pa-

thology. Nature of parasitism and disease resistance, 2 yr, $15,000.

University of Wisconsin. F. M. Strong, Dept. of Biochemistry. Chemistry and metabolism of biologically active substances, 3 yr, $15,700.

Woods Hole Oceanographic Institution. P. F. Scholander, physiologist. Mechanism of gas secretion in fishes, 2 yr, $8500.

Worcester Foundation for Experimental Biology. R. I. Dorfman. Metabolism of steroid hormones by the guinea pig, 3 yr, $20,000.

University of California, Berkeley. G. F. Papenfuss, Dept. of Botany. Marine algal flora of South Africa, 3 yr, $12,250.

University of California, Berkeley. A. E. Pritchard, Dept. of Entomology and Parasitology. Tetranychoid acarids of Europe, 1 yr, $6500.

Chicago Natural History Museum. C. C. Sanborn, Curator of Mammals. Catalog of the Microchiroptera, 5 yr, $10,000.

Duke University. R. M. Schuster, Dept. of Botany. Hepaticae of eastern North America, 2 yr, $7200.

Hollins College. P. M. Patterson, Dept. of Biology. Bryophyte flora of Virginia, 1 yr, $1000.

Michigan State College. I. W. Knobloch, Dept. of Natural Sciences. Flora of the Barranca Del Cobre Region, 1 yr, $1700.

New Mexico Highlands University. L. M. Shields, Dept. of Biology. Nitrogen sources and nitrogen content of plants in gypsum, lava, and alkali deserts, 2 yr, $3450.

Texas A. & M. Research Foundation. S. O. Brown, Dept. of Biology. Microscopic structure of fossil bone, 1 yr, $2650.

University of Wisconsin. J. T. Medler and S. D. Beck, Dept. of Entomology. Nutrition of plant-sucking Hemiptera, 2 yr, $6500.

Harvard University. G. R. Willey, Peabody Museum of Archaeology and Ethnology. Prehistoric settlement patterns in the Maya area, 1 yr, $11,500.

Mount Desert Island Biological Laboratory. W. F. Sheldon. Investigations in general and comparative physiology, 3 yr, $26,000.

For attendance at international meetings

Faraday Society, Discussion on Nucleic Acids and Nucleoproteins. E. Chargaff, Dept. of Biochemistry, Columbia University, $550.

Eighth Pacific Science Congress. M. C. Kik, College of Agriculture, University of Arkansas, $1300.

Eighth Pacific Science Congress. L. P. Schultz, Takoma Park, Maryland, $1400.

Eighth Pacific Science Congress. J. Thorp, Dept. of Geological Sciences, Earlham College, $1550.

For conferences in support of science

Beloit College. Cosponsored conference on geology research in small colleges, $2000.

Brown University. R. B. Lindsay. Conference on liquid structure and acoustics, $7000.

Bryn Mawr College. L. J. Berry, Dept. of Biology. Conference on the place of biological research in the liberal arts college, $7000.

New York University. H. H. Kendler, Dept. of Psychology. Symposium on problem solving behavior, $5700.

For education in the sciences

University of North Carolina. E. A. Cameron, Dept. of Mathematics. Support of summer conference in collegiate mathematics, 8 wk, $15,000.

University of Oregon. I. Niven, Dept. of Mathematics. Support of summer conference in collegiate mathematics, 8 wk, $15,000.

Science Service, Inc. W. Davis, Director. Support of Science Clubs of America, 1 yr, $10,000.

University of Washington. C. D. Allendoerfer, Dept. of Mathematics. Support of summer conference for high school mathematics teachers, 4 wk, $10,000.

University of Wyoming. E. R. Schierz, Dept. of Chemistry. Support of summer conference in collegiate chemistry, 5 wk, $10,500.

For policy studies

University of Chicago. I. Veith, Dept. of Medicine. Study of endowed and grant-supported research in the Division of Biological Sciences of the University of Chicago over the past twenty-five years, 3 yr, $12,500.

Harvard University. P. G. Frank, Dept. of Physics. Study of reasons for acceptance of scientific theories, 1 yr, $11,600.

For exchange of scientific information

University of Chicago. S. Polyak, Dept. of Anatomy. Publication of results of basic research entitled "The Vertebrate Visual System," 4 yr, $13,300.

Mineralogical Society of America. Publication of expanded issue of *The American Mineralogist,* 1 yr, $1100.

University of Pennsylvania. L. V. Heilbrunn, Zoological Laboratory. Editing of an international treatise on protoplasm entitled "Protoplasmatologia," $1000.

New York University. S. A. Korff, Dept. of Physics. Survey of high altitude cosmic ray stations, 2 yr, $1000.

Smithsonian Institution. S. L. Deignan. Support of "Biological Sciences Information Exchange," 1 yr, $22,000.

Torrey Botanical Club. E. Lawton, Treasurer. Publication of a 75-year index of the Bulletin of the Torrey Botanical Club, 3 yr, $5000.

For scientific manpower

American Institute of Physics. H. A. Barton, Director. Register of scientific and technical personnel in the field of physics, 1 yr, $14,500.

American Meteorological Society. K. C. Spengler, Executive Secretary. Register of scientific and technical personnel in the field of meteorology, 1 yr, $9000.

National Bureau of Economic Research. S. Fabricant, Acting Director. Technical study of methods for determining demand and supply of specialized personnel, 1 yr, $25,000.

Six graduate students from the fields of demography, sociology, conservation, economics, and geography will be chosen for the **Population Reference Bureau's 6-wk Summer Workshop** in Washington, D.C., beginning June 14. Participants will be paid $50 a week toward transportation and subsistence in Washington for the duration of the session.

Applications should be submitted before Apr. 1, to Mr. Robert C. Cook, Director, The Population Reference Bureau, 1507 M St., NW, Washington, D.C. Each application should explain how the student's major interest is related to the population problem and should be accompanied by two supporting letters from professors, instructors, and/or faculty advisers.

In the Laboratories

The opening of a branch assembly plant and European sales headquarters in Munich, Germany, has been announced by **Beckman Instruments, Inc.,** of South Pasadena, Calif. The new factory will be staffed chiefly by Europeans, with some key personnel transferring from the company's U.S. plants. Production initially will be limited to portable pH meters and quartz spectrophotometers. The address of both the German factory and the European sales headquarters is Elektron Instrumente G.m.b.H., Gröbenzellerstrasse 13, Munich-Puchheim, Germany.

The entire operation represents a first step in Beckman's expanded foreign activities, pointing to additional offices in Latin America and the Far East. Overall coordination of Beckman export sales and foreign service is handled by the newly-formed International Division, headed by Robert T. Jones, with headquarters at the main plant at Fullerton, Calif.

A powerful "percolating tea kettle" nuclear reactor has been designed and built by North American Aviation for the U.S. Atomic Energy Commission. The new reactor now is in operation by the **California Research and Development Company,** Livermore, a contractor of the San Francisco Operations Office of AEC. Developing 100 watts, the reactor is unique in that it is the largest unit of its type to operate with a closed cycle, or self-contained system. The tea kettle

or water boiler type reactor, one in which the fissionable uranium compound is contained in a water solution, is so designed that all radioactive by-products of the fission process are retained in the unit instead of being exhausted and mixed with the open air, as in the case of other large reactors of this type. Radioactive by-products in the North American reactor are processed inside the unit and returned to the reactor core. It is possible for the reactor to run for as long as 10 yr without refueling.

The **Commercial Solvents Corporation** has announced plans for a $5,000,000 construction and expansion program for the commercial production of nitroparaffins, which heretofore have not been available in volume. The program will consist of new facilities at Sterlington, La., which will account for the major portion of the investment, and enlargement of the company's semi-commercial nitroparaffins operation in Peoria, Ill. The great potential of nitroparaffins lies in their remarkable and versatile abilities as raw materials for producing other chemicals.

Meetings and Elections

The **47th Annual Meeting of the Air Pollution Control Association,** whose headquarters are in Mellon Institute, Pittsburgh, Pa., will be held in Chattanooga, Tenn., May 3–6. Some 600 management executives and other representatives of the industries, research scientists, and air pollution control officials will attend. Thirty-five technical papers will be presented covering the subjects of coal, incineration, petroleum, municipal problems, dusts and fumes, steel, odors, measurements, and meteorology. The last day of the meeting will be set aside for plant inspection trips to study air pollution and control devices.

Six thousand North American biologists will meet in Atlantic City, N.J., Apr. 12–16, to participate in the **38th Annual Meetings of the Federation of American Societies for Experimental Biology.** Some 1700 papers covering current researches in physiology, biochemistry, pharmacology and experimental therapeutics, experimental pathology, nutrition, and immunology will be presented in 172 sessions at Convention Hall and the Hotel Dennis.

A joint session, presided over by K. K. Chen, chairman of the Federation Board, will feature reviews by three eminent investigators on such topics as immunization in poliomyelitis, physiology of the thyroid, and addiction to narcotics. Throughout the week special sessions, symposia, and panel discussions will direct attention to teaching principles and techniques in research training, clinical medicine, and medical practice. Developments in neurophysiological research will be treated in a discussion-display session, and "frontiers" in biochemistry will be informally presented by recent Nobel Prize winners.

Industrial exhibits of books, chemicals, pharmaceuticals, foods, equipment, and apparatus will be located in the main areas of Convention Hall. These will include some displays that amplify papers presented in scientific sessions.

The Federation Placement Service will operate a clearing-house during the Meetings to facilitate interviews between persons seeking positions and representatives of institutions or industrial firms that wish to fill vacancies.

The **1954 Eastern States Health Education Conference of the New York Academy of Medicine** will be held at the Academy on Apr. 29–30. The program will include four sessions and an evening dinner meeting. The subject of this year's conference will be "Communication in health education." Among the contributors to the conference are William McPhee and Elihu Katz of Columbia University's Bureau of Applied Social Research, Louis Hacker of the School of General Studies at Columbia University, Leo Lowenthal of the U.S. State Department's Voice of America, Shirley A. Star of the National Opinion Research Center at the University of Chicago, and Earl Lomon Koos of the School of Social Welfare at Florida State University.

A workshop session on the concepts of communication will be held in conjunction with the meeting. Participation in the Conference is limited. Those interested should write to Dr. Iago Galdston, The New York Academy of Medicine, 2 E. 103 St., New York 29.

The Division of Chemical Education of the American Chemical Society has announced the following three summer conferences:

Fifth General Chemistry and First Organic Chemistry Conference (Workshop), Eastern Session, North Carolina State College, Raleigh, June 16–26. Programs are being planned for both college and secondary school teachers. Colored teachers of chemistry are invited. Douglas Nicholson is the director for the ACS Division of Chemical Education. Information and requests for registration should be directed to Dr. Walter J. Peterson, Head, Department of Chemistry, North Carolina State College, Raleigh.

Fifth General Chemistry Conference (Workshop), Kenyon College, Gambier, Ohio, June 25–July 2. Although this program is planned for the college and secondary school teachers in those institutions participating in the School and College Study of Admission with Advanced Standing, the Conference will be similar to the previous workshops, and teachers not involved in the program are encouraged to attend. This Conference is supported in part by the funds allocated to the afore-mentioned study. Edward Haenisch is the director for the ACS Division of Chemical Education. Information and requests for registration should be directed to Dr. Bayes Norton, Kenyon College, Gambier, Ohio.

First Chemistry Institute, University of Wyoming, Laramie, June 12–Aug. 20. This 5-wk Institute will take the place of the Fifth General Chemistry Workshop for the Western United States. The program will be devoted to recent advancements in chemistry, with

particular attention to the needs of the teachers in the 4-yr and junior colleges. Emphasis will be placed on the teaching problems of general, analytical, and organic chemistry. This Institute is being sponsored by the National Science Foundation and funds are available to assist a number of chemistry teachers to attend. Information may be obtained from Dr. E. H. Schierz, Head, Department of Chemistry, University of Wyoming, or Dr. Otto M. Smith, Chairman, Committee on Teaching of College Chemistry, Oklahoma A. & M. College, Stillwater.

The USA National Committee of the **International Scientific Radio Union (URSI)** and the **Institute of Radio Engineers Professional Group on Antennas and Propagation and Microwave Theory and Techniques (PGMTT)** are jointly sponsoring a meeting at the National Bureau of Standards, Washington, D.C., May 3–6. A combined technical session of interest to all participants is scheduled for the morning of May 4, to be followed by one or more sessions in each of the following fields: radio measurement methods and standards; tropospheric radio propagation; ionosphere radio propagation; terrestrial radio noise; radio astronomy; radio waves and circuits, including general theory; antennas; electronics.

A symposium on millimeter waves, planned jointly by the PGMTT and URSI Commission 6, will be a feature of the meeting. Additional details and registration blanks are available from the secretary of the USA National Committee, W. E. Gordon, School of Electrical Engineering, Cornell University, Ithaca, N.Y.

Phi Lambda Upsilon has elected the following officers for 1954–57: pres., James M. Church, Department of Chemical Engineering, Columbia University; v. pres., Carl S. Carlson, Morton Salt Co., Chicago, Ill.; sec., Thomas B. Cameron, Department of Chemistry, University of Cincinnati; treas., William B. Schrenk, Department of Chemistry, Kansas State College.

Plans have now been completed for the **1954 Southern Industrial Wastes Conference** to be held in Houston, Tex., Apr. 21–23. The program is jointly sponsored by the Southern Association of Science and Industry, the Texas Chemical Council, and the Manufacturing Chemists' Association. Presiding officers will be A. P. Black, president of the Southern Association of Science and Industry; William C. Foster, president of the Manufacturing Chemists' Association, and J. D. Harper, president of the Texas Chemical Council. L. L. Hedgepeth of the American Cyanamid Company is chairman of the Conference.

The 30th annual meeting of the **Southwestern Division of the AAAS** will be held on Apr. 25–29 in Lubbock, Tex., on the campus of the Texas Technological College. Meetings to present papers reporting original investigations will be held by the botanical, physical, social, and zoological science sections. In addition, there will be numerous symposia in such varied fields as instrumentation, ground waters, and desert and arid region problems. On Monday evening the annual John Wesley Powell Memorial Lecture, honoring the noted explorer of the Grand Canyon of the Colorado River, will be given on "A new era in human understanding" by Roger J. Williams, professor of chemistry and director of the Biochemical Institute of the University of Texas. Through the courtesy of the local chapter of Sigma Xi, the Division has arranged for a talk by Henry Eyring, dean of the Graduate School of the University of Utah, on "Nonlinear departures from equilibrium." During the meeting, participants are invited to view a number of exhibits in the museum, the most interesting of which is the display of 26 models of Leonardo da Vinci's mechanical inventions. Field trips are always an important part of these meetings. This year Frank Blair, president of the Southwestern Association of Naturalists (SWAN), has offered the services of SWAN in the organization and sponsoring of field trips for the entire meeting.

Joining with the Division in this meeting are the Texas Academy of Science, the Oklahoma Academy of Science, the Southwestern Association of Naturalists, and a number of other local and regional groups. Now that part of Wyoming and Montana are included in the Division, a goodly representation from these states is expected and several interesting papers from them have already been promised. With this recent expansion of territory, it seems appropriate that the Division's name be changed to something like "Southwestern and Rocky Mountain" or "Desert Range and Rocky Mountain." Suggestions for a new name will be appreciated.

As is always the case, papers by both members and nonmembers are solicited and residence in the area is not a requirement. It is hoped that programs will be distributed by Apr. 18. Titles and abstracts arriving too late for inclusion in the regular program will be placed on a supplementary program that will be presented if time permits. Inquiries should be directed to Frank E. E. Germann, Executive Secretary, Boulder, Colo.

The 502nd meeting of the American Mathematical Society, which will include a **Symposium in Applied Mathematics** sponsored by the Society and the Office of Ordnance Research, will be held at the University of Chicago Apr. 29–May 1. The symposium will consist of three sessions under the chairmanship of L. E. Simon, T. J. Killian, and W. W. Leutert. The subjects to be covered are operations research, probability theory, statistics, numerical analysis, elasticity, and differential equations. Addresses will be delivered by P. M. Morse, Jerzy Neyman, J. E. Mayer, H. O. Hartley, M. R. Hestenes, A. A. Bennett, C. A. Truesdell, J. J. Stoker, Florent Bureau, William Feller, and John Todd. By invitation of the Committee to Select Hour Speakers for Western Sectional Meetings, S. C. Kleene will address the Society. For further details write to J. W. T. Youngs, Bloomington, Ind.