News and Notes

New Techniques Highlight Calorimetry Conference

EXTREME high temperatures, miniature bomb calorimeters, thermistors, and liquid helium studies were described in the wide range of papers presented at the Eighth Annual Calorimetry Conference, which was held at the Institute for the Study of Metals, University of Chicago, on September 11–12. The program, which included individual and committee reports and a round-table discussion, was arranged by E. J. Prosen, National Bureau of Standards. Approximately one hundred scientists attended the sessions, at which Guy Waddington, Bureau of Mines, Bartlesville, was the presiding officer.

In the introductory remarks by J. W. Stout, University of Chicago, the various calorimetric programs at the University were outlined. These investigations include heats of solution and dilution of salts, strain energies in metals, and properties of materials below 1° K.

The design and performance characteristics of small bead-type thermistor thermometers were discussed by E. V. Larson, Brown Instrument Company. The extremely small size (less than 0.1 in. in diameter), rapid response, and high sensitivity make these instruments extremely useful. Recent developments in manufacture have produced thermistors that are stable and are ten times more sensitive to temperature changes than are resistance thermometers.

A liquid helium calorimeter designed for the temperature range 1–5° K was described by W. S. Corak, Westinghouse Research Laboratories. Studies on the specific heats of well-annealed samples of Cu, Ag, and Au were presented. The electronic contributions to the specific heat, which are represented by a term linear in the absolute temperature, are in satisfactory agreement with previously reported data for Cu and Ag; the Debye temperatures agree with those calculated from elastic theory. David White, Ohio State University, described the helium calorimeter in use at Ohio State. The heat transfer in this apparatus is accomplished by helium gas flowing through a small capillary tube in good thermal contact with the block. Data were presented on the heat capacities of tantalum and niobium (columbium) from 1–25° K.

A miniature bomb calorimeter for the determination of heats of combustion of organic samples of 20–50 mg mass with a precision of better than 0.5% was reported by W. S. McEwan and C. Anderson, Naval Ordnance Test Station, Inyokern. A lightweight bomb, coaxial stirrer, and special sample holder are some of the unique design features. The apparatus is particularly useful for studies on the heats of combustion of explosive materials, where large samples may present serious hazards. C. E. Messer, Tufts College, described a bomb calorimeter designed to determine the heats of reaction of metals and metal hydrides with water. Use of the bomb technique confines the usually vigorous reaction and prevents the escape of the evolved hydrogen, thus avoiding a serious correction for the heat lost by the escaping gas. The heats of hydrolysis of Li, LiH, Na, and NaH were reported and the heats of formation of the hydrides were calculated. L. G. Cook, Atomic Energy of Canada, Ltd., presented the design and operating characteristics of a vacuum jacketed bomb calorimeter for precision measurements of heats of combustion. Use of the vacuum jacket reduced the overall heat leakage to 0.000^4 deg/min/deg which is a factor of 6 smaller than that which is usually found in standard air-gap types. Calibrations with benzoic acid showed a maximum deviation of ± 0.015%. A high precision isothermal calorimeter useful for studying small thermal effects occurring over long periods of time was described by P. Gordon, University of Chicago. The apparatus, using an organic vapor thermostat and a differential thermopile, has a sensitivity of approximately 0.002 cal/hr and has been used to study the evolution of stored energy in deformed copper samples as the metal is annealed.

A high temperature drop calorimeter, operating under high vacuum with radiofrequency heating and an ice calorimeter, has been developed at Ohio State University to measure heat contents from 1000–3000° K. This apparatus was described by M. Hoch, who discussed the sources and magnitudes of the experimental errors involved. A precision of approximately 0.35% has been obtained.

Malcolm Dole, Northwestern University, described the construction and operation of a new type of adiabatic bimetallic jacket for calorimetric studies of high polymers. This jacket diminishes the possibility of "hot spots" during heating and thus allows a more even distribution of energy over the unit. The general problem of adiabatic shield control for high precision adiabatic calorimeters was discussed by G. Guthrie, Bureau of Mines, Bartlesville, and a round-table discussion of the problem ensued.

The report of the Committee for the Publication of Data was presented by the Chairman of the committee, E. F. Westrum, Jr., University of Michigan, and was discussed by the Conference. A resolution outlining the recommendations of the Committee for proper publication of thermal data was approved by the Conference. This resolution will be submitted to the editors of various scientific journals.

H. F. Stimson, National Bureau of Standards, discussed the present status of units of energy and temperature scales. He pointed out that the International Conference of Weights and Measures is preparing to adopt a thermodynamic scale of temperatures which will differ slightly from that presently in use. C. H. Shomate, Naval Ordnance Test Station, Inyokern, explained the advantages in correlating and smoothing high and low temperature heat content data by use of

a modification of the usual equations involving a power series in the absolute temperature. H. L. Finke, Bureau of Mines, Bartlesville, presented a comparison of the thermal data on the Calorimetry Conference standard sample of *n*-heptane obtained independently at the low temperature laboratories at the National Bureau of Standards and at Bartlesville. The results indicate that the agreement between the two laboratories is better than 0.2%, which is within the accuracies claimed by the two laboratories.

At a business meeting held after a group luncheon on Saturday afternoon, the following officers for the coming year were elected: E. J. Prosen present Chairman Elect, succeeds Guy Waddington as Chairman for 1954. Warren De Sorbo, General Electric Company, was chosen Chairman Elect. The Board of Directors for the coming year will consist of the above officers together with J. W. Stout, E. F. Westrum, Jr., Guy Waddington, and D. R. Stull, Dow Chemical Company.

The Role of Proteins in Ion Transport Across Membranes

A symposium on The Role of Proteins in Ion Transport Across Membranes was held Oct. 2 and 3, at the College of Physicians and Surgeons, Columbia University, New York. This conference was organized to bring together a small group of leaders in physical chemistry and a small group of biologists active in the field, and to explore the possible fruitfulness of such contacts for further research. In order to maintain informality of discussion, the number of participants was limited to 50, and only 8 lectures were given during the 2-day meeting.

The problem of ion transport is of general biological importance and of special interest in various functions, such as renal excretion and the generation of bioelectric potentials of nerve and muscle. The availability of radioactive materials has opened up much new information concerning ion movements, but the underlying molecular mechanisms are still obscure. Since this is a field in which biology has advanced close to the molecular level, it can obviously profit by the intellectual cooperation of physical chemists with biologists.

After a welcoming address by Dean Willard C. Rappleye, the following lectures were presented: Ion Transport Across Biological Membranes (Hans H. Ussing); The Generation of Bioelectric Potentials (Irwin B. Wilson and David Nachmansohn); Statistical Theories of Diffusion and Membrane Permeability (Ransom Parlin and Henry Eyring); Application of Irreversible Thermodynamics to Biological Systems (John G. Kirkwood); Ion Transport Across Charged Membranes (George Scatchard); Experiments on Field-Induced Transports (Peter J. W. Debye); Electrochemical Studies with Model Membranes (Karl Sollner); Interaction of Plasma Mercaptalbumin with Mercuric Ion and Organic Mercurials (John T. Edsall). David Rittenberg, Louis P. Hammett, I. I. Rabi, and Raymond L. Fuoss were the chairmen of the four sessions. There were several guests from Europe, among them Professors F. J. W. Roughton (Cambridge), Hans H. Weber (Tübingen), and G. Ehrensvärd (Stockholm). Every lecture was followed by lively discussions and both groups felt that the conference was a stimulating experience.

The meeting was made possible by a grant from the National Science Foundation. The lectures given at the conference and a few additional related papers, not included in the program, will be published by the Academic Press.

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The 1953 Nobel Prize Awards

Editor's Note: By now everyone is aware of the names of the new Nobel prize winners, but their full record of achievement and their personal histories are very likely known only to biochemists. The following accounts have been specially prepared for SCIENCE by persons who have worked with Krebs and Lipmann in their own laboratories and know them exceptionally well.

The award of a Nobel Prize to **Hans Adolf Krebs** is fitting recognition of his fundamental investigations in intermediary metabolism. He is primarily known for the elucidation of the ornithine cycle by which urea is synthesized, and for the demonstration of the tricarboxylic acid cycle. The latter is now recognized as a major pathway for the oxidation of carbon compounds in animal tissues. Both investigations are landmarks in the development of modern biochemistry.

Hans Adolf Krebs was born Aug. 25, 1900, at Hildesheim, Germany, the son of Georg Krebs, M.D., and Alma Davidson. In the usual European fashion, his university training was received at a number of institutions, including Göttingen, Freiburg, Munich, and Berlin. He received his M.D. degree from Hamburg in 1925. Even during the period of his medical training he found time for laboratory work, and it was natural, therefore, that after completing his degree he should become an assistant in Professor Warburg's Department at the Kaiser Wilhelm Institute for Biology at Berlin-Dahlem. During the following five years, Krebs worked on a variety of problems associated with the scientific interests of Warburg's group, and also began work on the deamination of amino acids which was to be completed later at Cambridge.

In 1932, he became Privat Dozent of Internal Medicine in Professor Thannhauser's Clinic at Freiburg. Here, in spite of the press of clinical duties, he continued with laboratory work and made his first major contribution to biochemical science in working out the cyclic process for urea synthesis in mammalian liver.

With the advent of the Nazis, Thannhauser was ousted from his clinic and Krebs was forced to leave Germany. At the invitation of Professor Sir Frederick

Gowland Hopkins, who greatly admired his work, he joined the Department of Biochemistry at Cambridge University, first as a Rockefeller Research Fellow, and later as University Demonstrator in Biochemistry. During this time, he continued to study the enzymic deamination of amino acids and was concerned with the general question of the mechanism of hydrogen transport in animal tissues. In 1935 he became Lecturer in Pharmacology at the University of Sheffield. His interest in the role of succinic and fumaric acids in cellular respiration led to the elegant series of experiments which resulted in the demonstration of the citric acid cycle. Although both the mechanisms for urea synthesis and for pyruvate oxidation involve cyclic processes, they do not appear to have emerged from any similar preconceived method of experimental attack. In the case of urea synthesis, Krebs' careful series of experiments were necessary to construct a system which was practically unknown; in the case of the citric acid cycle, his discovery, with W. A. Johnson, of a mechanism for the synthesis of citric acid from oxaloacetic acid and pyruvic acid supplied the missing step that permitted him to organize many previously known facts into a coherent pattern. In both cases, however, description of the qualitative nature of the processes that occurred was followed by experiments which demonstrated their quantitative importance in cellular activity.

During this same period he also continued work which he had started in Freiburg on the synthesis of purines in avian liver. In birds, the purine uric acid is the major nitrogenous excretory product, replacing the urea of mammals. Krebs showed that hypoxanthine was an intermediate in the formation of uric acid, and demonstrated a net synthesis of hypoxanthine from ammonium pyruvate in isolated slices of pigeon liver. This work, like experiments on the conversion of carbon dioxide and pyruvic acid to oxaloacetic acid in pigeon liver, was an important starting point for work in other laboratories, using isotopic tracer methods which were not available to Krebs until after the war.

During the war years which followed, Krebs supervised research for the British Medical Research Council on the human nutritional requirements for vitamin A and ascorbic acid. As a result of these studies, the official recommended requirement for dietary ascorbic acid was reduced from 70 mg per day to 30 mg.

Since 1945 Krebs has investigated the oxidation of acetate by yeast, and concluded that in this organism the tricarboxylic acid cycle is not a major pathway for the oxidation of acetate. He has also described a number of analytical techniques, including those for the manometric estimation of glutamic and aspartic acids and their amides by the use of specific enzymes. In this period came experiments on the accumulation of glutamic acid by isolated tissue slices, together with measurement of the accumulation and exchange of potassium ions in the same system. The results bear directly on the important question of the relation between ion transport and metabolic reactions, especially with respect to the central nervous system.

The Rockefeller Foundation has continuously supported Krebs' research since the early days in Sheffield. In 1945 the British Medical Research Council established the Unit for Research in Cell Metabolism at Sheffield University under his direction, and at this time he was made Professor of Biochemistry in the University, and new quarters were made available for his department. Soon afterwards, in 1947, he was elected a Fellow of the Royal Society. Shortly after the announcement of his Nobel Prize in Medicine, he received a Lasker Award from the U.S. Public Health Association for his "outstanding contributions to medical research and public health."

In 1938, Krebs married Margaret Cicely Fieldhouse, of Wickersley, Yorkshire. They now have two sons and a daughter. Like many of their neighbors in Yorkshire industrial towns, Krebs and his family spend many happy hours on the moors and hills of the surrounding countryside.

Although Krebs is most prominently known for his fundamental investigations, he shows keen interest in the more practical aspects of biochemistry, and especially in its applications to clinical medicine. He takes an active part in the teaching of biochemistry to the medical students at Sheffield. Besides carrying out his own research, Krebs now devotes a considerable portion of his time to the dozen or more investigators in his own laboratory. Papers emanating from the various research groups in his laboratory cover a wide variety of topics, including the secretion of acid by the stomach, the synthesis and secretion of amylase by isolated slices of pigeon liver, and the transferring action of carbohydrate-splitting enzymes. The atmosphere of the Sheffield laboratory is one of unusual harmony as well as intellectual stimulation. This is due in no small measure to Krebs' personal and intellectual qualities, and to his cordial interest in the scientific and other problems of his colleagues. His ability to plan the exact necessary experiment, his grasp of all pertinent factors in an experimental situation, his efficient utilization of his time and facilities, and his ability to synthesize data into a coherent pattern, are the admiration of his colleagues and students.

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The biochemical career of **Fritz Lipmann,** a cowinner with Hans Krebs of the 1953 Nobel Prize in Medicine and Physiology, has been one in which outstanding experimental ability has been combined with an unusual creative capacity. His contributions are certainly indicative of these attributes.

Lipmann began his biochemical studies with Rona in Berlin. It was here that his interest in intermediate metabolism developed and prompted him to join Otto Meyerhof's laboratory at the Kaiser Wilhelm Institute. Meyerhof indoctrinated him into the problem of the energetics of living systems. Lipmann's contributions to these problems have been of the greatest sig-

nificance, and there is no question that many of his concepts have been instrumental in the present rapid development of biochemistry. At the Kaiser Wilhelm Institute, Lipmann also was able to gain a great deal of laboratory "know how," particularly from Karl Lohmann.

After leaving Meyerhof's laboratory in 1931, he spent a year at the Rockefeller Institute with Phoebus Levene. The work on serine phosphate, carried out at the Rockefeller Institute, can now be considered as a pioneer endeavor into the present blossoming field of phosphoproteins.

Sensing an unhealthy atmosphere in the rising power of Hitler, Lipmann decided his future was best elsewhere, and did not return to Germany. He took a position at the Carlsberg Laboratories in Copenhagen in 1932. Here he worked on the Pasteur effect and the glucose-6-phosphate oxidative pathway. It was in Denmark that Lipmann began the investigations which eventually led to the discovery of coenzyme A and its significance in metabolic reactions.

Lipmann became interested in the role of thiamine and its relationship to pyruvate oxidation. He initiated a study of *Lactobacillus delbruckii* because of the apparent solubility of the pyruvate oxidase system in this organism. His investigations eventually led to the isolation of acetyl phosphate as a product of pyruvate degradation. However, the actual accomplishment of this isolation proceeded with great difficulty, not only because of the nature of the problem, but because of his move to the United States in 1939.

Lipmann's first position in the United States was at Cornell University Medical School. In 1941 he took over a small laboratory at the Massachusetts General Hospital, where he completed his work on acetyl phosphate. His outstanding ability was soon recognized by the staff of Massachusetts General Hospital, and they encouraged his work by continuing to increase his facilities and support. At present he is Head of the Biochemical Research Laboratory, which is located in the new research building of the hospital, and in which at present a number of postdoctoral and predoctoral fellows are receiving training. He is also Professor of Biochemistry at the Harvard Medical School, an appointment which he received in 1949.

At the Massachusetts General Hospital, Lipmann began a study of the mechanism of acetylation of aromatic amines. He started this investigation because he believed that acetyl phosphate might act as an acetyl donor in this reaction, and that this might lead also to a better understanding of the general problems of fat metabolism and protein synthesis.

It was in this work on acetylations that coenzyme A was discovered and eventually shown to contain pantothenic acid. The early studies of Lipmann and his coworkers on the coenzyme indicated its great significance, and as a result, many of the problems in carbohydrate and fat metabolism have now been solved. Present experiments also suggest that coenzyme A plays a role in sterol and protein synthesis, and it is likely that in the next few years, these problems will be elucidated because of the present knowledge of coenzyme A function.

Lipmann's paper in 1941 on the "Metabolic Generation and Utilization of Phosphate Bond Energy" has unquestionably had a decided influence on biochemical thinking. The concept of the energy-rich phosphate bond was clearly stressed in this paper, and it was this paper which focused attention on the importance of the phosphate bond in promoting biosynthetic reactions. At present Lipmann is carrying out work on the thyroid hormone as a regulator of phosphate bond generation. This is a field which has long intrigued him.

It is a tribute to Fritz Lipmann that he was able to carry out his work under what were sometimes the most unfavorable conditions. His contributions and creativeness are self evident of his remarkable scientific ability, while those of us who have been associated with him intimately know him not only as a distinguished scientist, but a warm, considerate person whose greatness is beyond his scientific attributes.

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Science News

The first positive identification of some tissues in which antibodies actually are formed is described in a paper, entitled **"The Formation of Tetanus Antitoxin by Spleen and Lymph Node Intraocular Transplants,"** that appeared in the September issue of the *Yale Journal of Biology and Medicine*. Written by William M. Hale, now professor of bacteriology at the University of Tennessee Medical School, and Richard D. Stoner of the bacteriology division of the Medical Department, Brookhaven National Laboratory, the article describes experiments conducted at Brookhaven, under sponsorship of the U.S. Atomic Energy Commission.

Drs. Hale and Stoner used cobalt 60 gamma radiation, together with implantation of tissues into the eyes of irradiated mice, to find out where antibodies are formed. They now report the first direct evidence that the spleen and lymph nodes produce antibodies to tetanus toxoid.

The two bacteriologists immunized a group of mice with the antigen, tetanus toxoid. The irradiated animals had been exposed to amounts of gamma radiation known from previous experiments to be sublethal, yet sufficient to destroy the animals' ability to produce antibodies. Since the radiation prevented antibody formation in the recipient animals, any antibody now formed would presumably come from the transplanted tissues growing in the anterior chamber of the host's eyes.

Spleen and lymph node transplants produced significant amounts of antibody under these conditions. In addition, intravenous injection of the recipient animals with tetanus toxoid greatly increased

antibody formation by the tissues in the eyes of irradiated mice. Tissues other than spleen and lymph nodes are now being tested to determine whether these, also, may be sites of actual antibody production. Bone marrow, liver, lungs, blood, central nervous system, and other sites have been mentioned as possibilities by various investigators.

Current experiments also will evaluate antibody formation resulting from use of different methods of introducing antigens into donor animals: under the skin, through the peritoneum, or, as in the experiments reported in the *Yale Journal,* into the blood stream. In Hale's and Stoner's experiments to date both donor and recipient animals have been from a single inbred strain of mice.

A report by R. G. Bunge and J. K. Sherman (*Nature,* Oct. 24, 1953) tells of the successful **impregnation** of three women at the State University of Iowa Medical School with spermatoza that had been pretreated with 10% glycerol and then frozen with "dry ice." Of spermatoza so treated, 67% survive after thawing. The three recipients were respectively nulliparous, primiparous, and nulliparous, and in August had missed six, five, and three menses respectively, and had positive Ascheim-Zondek tests and other signs of well-advanced pregnancy. The three women's personal histories "indicate a high degree of integrity and the source of the conceptions is valid."

Samuel N. Kramer, a cuneiformist at the University Museum, University of Pennsylvania, and Martin Levey, a chemist of Pennsylvania State College, have translated the **oldest known medical "handbook,"** a 4000-year-old Sumerian clay tablet. The tablet lists an anonymous doctor's prescriptions for salves, filtrates, and internal remedies, and is notable for the absence of any taint of sorcery or mysticism.

Scientists in the News

The Board of Directors of the AAAS, at its meeting on Oct. 18, voted unanimously to invite **Carlos E. Nabuco de Araujo, Jr.,** of Químico Analista e Industrial, Rio de Janiero, to serve as the official representative of the Association at the meeting of the Latin American Association for the Advancement of Science in Paranha, Brazil.

Roy Elwood Clausen, Professor of Genetics and Chairman of that department, has been named Faculty Research Lecturer on the Berkeley campus of the University of California for the academic year 1953–54. Dr. Clausen was selected because of his outstanding career in genetics "as both teacher and investigator." He is widely known for his research on the heredity of Nicotiana, the tobacco plant, with emphasis on the transference of disease-resistant traits from one species to another.

The Board of Trustees of *Biological Abstracts* announces that **G. Miles Conrad** has been appointed Director of *Biological Abstracts,* a new post designed to integrate more completely the abstracting, indexing, business management, and special services of the organization. Most recently he has been concerned with document reproduction, information retrieval, and surveys of user reaction as head of Documentation Research, Technical Information Division, Library of Congress. His past experience includes field and laboratory research in ichthyology and mammalogy with the American Museum of Natural History and writing and editing in the fields of biology, chemistry, and engineering for a number of scientific and technical magazines.

At the Fall Members' Meeting in October, the Brooklyn Botanic Garden awarded its Distinguished Service Medal to **Benjamin Minge Duggar** for his discovery of aureomycin.

Similarly honored were **Mr. and Mrs. Walter D. Brownell,** for the development of 56 varieties of subzero, disease-resistant roses; and **Mrs. Dean Clay Osborne,** for the establishment at the Botanic Garden of the Osborne Memorial Horticultural Section.

Ludwik Gross, Chief of Research at the Veterans Administration Hospital, Bronx, N.Y., has received the Robert Roesler de Villiers Award for his contributions to the knowledge of the nature and cause of leukemia. The paper which earned the award for Dr. Gross was one of 226 papers from 22 countries which were submitted to the Foundation for its Contest II; in the first contest only 30 papers from 8 countries were considered.

Recently **Gilbert H. Grosvenor,** President of the National Geographic Society, received from Robert A. Anderson, Secretary of the Navy, the Navy's highest civilian citation, the Distinguished Public Service Award. The award was made in recognition of Dr. Grosvenor's direction and planning of expeditions and research jointly conducted by the Society and the Navy.

Louis G. Herrmann, Associate Professor of Surgery at the University of Cincinnati Medical College, has been made an honorary fellow of the Academy of Surgery of France.

The annual James Greenwood Lecture in Neurosurgery at the Universiy of Texas Medical Branch was given on Nov. 16 by **Sir Geoffrey Jefferson,** Professor of Neuro-surgery at the University of Manchester and President of the Manchester Literary and Philosophical Society. The subject of Sir Geoffrey's lecture was "The Anatomy of the Trigeminal Nerve and Its Clinical Significance." He also gave a special seminar on the opportunities of the search for the anatomical site of the soul.

Elvin C. Stakman, Emeritus Professor of Plant Pathology at the University of Minnesota and Past President of the AAAS, was unanimously re-elected as the Association's representative on the National Com-

mittee for UNESCO by action of the Board of Directors on Oct. 18, 1953.

Two A. Walter Suiter Lectures on mental health were presented at the New York Academy of Medicine on Nov. 5. **John C. Whitehorn,** Henry Phipps Professor of Psychiatry, The Johns Hopkins University School of Medicine, spoke on "The Acquiring and Imparting of Mental Health," and **Frederick C. Redlich,** Professor and Chairman of the Department of Psychiatry, Yale University School of Medicine, spoke on "The Influence of Environment on Mental Health."

Education

A unique electrical engineering laboratory has been donated to **Carnegie Institute of Technology** by Westinghouse Electric Corporation. Valued at approximately $100,000, the new installation is expected to stimulate student interest in power engineering, which has been somewhat overshadowed by the swift rise of developments in the communications field.

The laboratory will be used for education and research dealing with the detailed and advanced study of electrical power systems and advanced study of alternating current generators. The new facilities will provide for advanced instruction in rotating machinery for senior undergraduate students and work in power system stability for graduate students. The laboratory will be under the direction of Dr. E. M. Williams, Head of the Electrical Engineering Department at Carnegie Tech and will be supervised by Dr. H. M. McConnell, Assistant Professor of Electrical Engineering.

Modern scientific development and what it means to mankind will be considered in the **First Annual Symposium on Recent Advances in Science: Physics and Applied Mathematics** to be sponsored during the spring semester by New York University's Division of General Education. Scientists, engineers, mathematicians, and technicians will gather at NYU's Washington Square Center for the 15-week course to be conducted from 7 to 9:30 P.M., on Mondays, Feb. 8 to May 24. Designed for technically qualified persons who wish better to understand and appreciate contemporary scientific developments, the symposium presents a leading man of science each week in a session which also allows ample time for discussion.

The Council of The New York Academy of Medicine at its last meeting endorsed the Bicentennial Celebration of Columbia University, and voted to cooperate in the elaboration of the theme of the celebration, "Man's Right to Knowledge and the Free Use Thereof." In this direction the Committee on Medical Information of the Academy is dedicating its current series of **Lectures to the Laity,** dealing with the reciprocal relations between medicine and the other disciplines, to the bicentennial. The schedule for the final 3 lectures is as follows:

Jan. 6, "The Bearing of Anthropology upon Medicine." Benjamin D. Paul, Social Anthropology, Sch. of Pub. Health, Harvard University.

Jan. 27, "Where Law and Medicine Meet." David W. Peck, Presiding Justice, Appellate Div., N.Y. Supreme Court.

Feb. 3, "Medicine and Art." A. Hyatt Mayor, Curator of Prints, The Metropolitan Museum of Art.

With the support of the Foreign Operations Administration, **150 young scientists** belonging to the Organization for European Economic Cooperation (OEEC) will be brought to the United States to spend up to two years participating in research in American universities. A committee of the National Academy of Sciences, which met in October for the purpose of organization, will manage the program.

The plan stipulates that the visiting scientists are to have earned their doctorates in the natural sciences or engineering or to have had equivalent training so that they are ready to begin research as soon as they arrive in this country. Each one must also agree to return home after the two years of residence here. While in this country, the scientists will be paid a per diem subsistence and, in addition, funds will be provided for one trip a year to society meetings in their respective fields.

The academies of science and their related organizations in the foreign countries involved will make the preliminary nominations and send here a screened list of candidates, but the final choice will rest with the National Academy of Sciences committee.

The Department of Bacteriology and Preventive Medicine of the **University of Missouri** has become the Department of Microbiology. This change is in line with the expansion of the School of Medicine's 2-year basic science medical curriculum to the complete 4-year program.

Grants, Fellowships, and Awards

Nominations are solicited for the **1953 Borden Award in Nutrition** consisting of $1000 and a gold medal made available by the Borden Company Foundation, Inc. The American Institute of Nutrition will administer the award, which will be conferred in recognition of distinctive U.S. or Canadian research that has emphasized the nutritive significance of the components of milk or of dairy products. The award will be made primarily for the publication of specific papers, but the judges may recommend that it be given for important contributions over an extended period of time. It may be divided between two or more investigators. The formal presentation will take place at the annual meeting of the Institute in the spring of 1954. Nominations should be accompanied by data relative to the nominee and his research, and they *must be in the hands of the Chairman of the Nominating Committee by Jan. 1, 1954.* The Chairman is J. B. Brown, Institute of Nutrition & Food Technology, Ohio State University, Columbus 10.

The Fund for the Advancement of Education is again

offering approximately 250 Faculty Fellowships for the academic year 1954–55 to college teachers throughout the United States. The purpose of this program is to enable promising teachers to broaden their qualifications for teaching in their respective fields as part of a program of liberal education. Efforts will be made to seek out those teachers who are judged to have the greatest possibility for growth and development, rather than those who have already achieved recognized prominence in their fields. The Fund expects, as a result of these fellowships, to strengthen college teaching in the United States.

In the past three years, the Fund has granted similar fellowships to 750 college teachers from all states of the Union. Each fellowship provides a grant approximately equivalent to the salary of the recipient plus certain expenses. Candidates should be men and women between the ages of 30 and 45 who have been teaching steadily for several years, and each must be nominated by his institution. An institution of less than 600 undergraduates may nominate two candidates; institutions of 600 to 1500 undergraduates may nominate three; and institutions with more than 1500 may nominate four candidates. In each case, the institution nominating the candidates agrees to continue the recipient in his teaching career in 1955–56, and if possible, replaces him during his year as a fellow.

Fellowships are available in the humanities, the social sciences, and the natural sciences, but not in the technical or professional subjects, and the Committee on Faculty Fellowships, which administers this program, will consider any proposal which aims at broadening and improving the candidate's capacity to make his work a more vital part of liberal education. These fellowships are not intended to provide for the completion of doctorate study as such, or to support private and individual research projects, except as they bear directly upon, or are subordinate to, the effort to improve the candidate's teaching. Preference will be given to those candidates who, in addition to showing promise as outstanding teachers and scholars, are judged to possess the character and personality to become centers of influence on their campuses.

Application forms and full information concerning this program will be in the hands of the presidents of all colleges and universities in the United States within the next few days. *Applications must be submitted by Jan. 31, 1954,* and announcement of the awards will be made on or about April 8, 1954. Application forms and further information may also be obtained from The Committee on Faculty Fellowships, The Fund for the Advancement of Education, 575 Madison Ave., N.Y. 22, N.Y.

Under a program devised jointly by **McGill University and the Arctic Institute of North America** and supported financially by the Carnegie Corporation of New York, certain scholarships are offered to students possessing a bachelor's or master's degree or equivalent. These scholarships are tenable at McGill University, Montreal, and are normally offered to students proceeding to a doctoral degree in a subject calling for active field research in Arctic or Subarctic North America. Candidates who do not intend to proceed to a degree are not necessarily disqualified. Such subjects as anthropology, bacteriology, botany, geography (including glaciology and meteorology), geology, genetics, parasitology, psychiatry, psychology, sociology, and zoology will be considered, and successful candidates will be enrolled in one of these departments.

The scholarships are normally tenable for one year and are of average value of $1000 for the academic session, and $1250 for the expenses of a summer's field expedition. Applications should be submitted to the secretary of the Carnegie Arctic Program, Arctic Institute of North America, 3485 University Street, Montreal, P.Q., and should include a confidential recommendation of the candidate's qualifications in his or her selected field, and a clear statement of the intended arctic or subarctic research project. *Applications for session 1954–55 should reach Montreal by April 1, 1954. If field work in the summer of 1954 is anticipated, applications must be in by Jan. 1, 1954.* In arriving at decisions the committee will bear in mind the general furtherance of northern research and will pay particular attention to the demonstrated interest in the north and the physical suitability of candidates as well as to their academic qualifications.

The **National Science Foundation** will award individual grants to defray partial travel expenses of a limited number of American scientists who will attend the following meetings:

The 3rd Congress of the International Association of Gerontology, to be held in London, England, July 19–23, 1954.

The 8th Congress of the International Society for Cell Biology, to be held in Leiden, Netherlands, Sept. 2–9, 1954. Application blanks for grants may be obtained from the National Science Foundation, Washington 25, D.C. *Completed applications must be returned to the Foundation by Feb. 15, 1954,* and announcement of the awards will be made in March.

Nominations are invited for the **1953 Osborne and Mendel Award** of $1000 established by the Nutrition Foundation, Inc. for the recognition of outstanding accomplishments in the general field of exploratory research in the science of nutrition. The award will be given to the investigator who has made the most significant published contribution in the year preceding the annual meeting of the Institute, or who has published a series of contemporary papers of outstanding significance.

The recipient will be chosen by a Jury of Award of American Institute of Nutrition. As a general policy, the award will be made to one person; however, to prevent an injustice it may be shared by several persons. Preference will be given to research workers in the United States and Canada, but investigators in other countries, especially those sojourning in the

United States or Canada for a period of time, are not excluded from consideration. Membership in the Institute of Nutrition is not a requirement for eligibility, and there is no age limitation. Nominations may be made by anyone. Accompanied by data relative to the accomplishments of the nominee, they *should be sent before Jan. 1, 1954,* to the Chairman of the Nominating Committee, H. E. Robinson, Research Laboratories, Swift and Co., Union Stock Yard, Chicago 9, Ill.

The Population Council, Inc., has organized a fellowship program in the study of population to assist in the advanced training of students in the social and natural sciences at the predoctoral or postdoctoral levels. The Council is planning to grant approximately six fellowships (for study in the United States and elsewhere) during the academic year 1954–55, to be divided between students from the United States and from other countries. Fellows will normally receive support for full-time work for a period of about one year. The basic stipend at the rate of $2500 per year may be supplemented to provide for maintenance of dependents and, especially in the case of foreign students, for travel or exceptional expenses. It may be diminished because of lesser need or partial support from other sources. Somewhat larger stipends may be granted to postdoctoral than to predoctoral fellows. Preference will be given to candidates who are not over forty years of age.

For information or application forms relating to this program, inquiries should be addressed to Mr. Frederick Osborn, Executive Vice-President of The Council, 230 Park Avenue, New York 17, N.Y. *Applications for fellowships for the academic year 1954–55 should be received before Feb. 1, 1954.*

The **School of Civil Engineering of Cornell University** has announced the establishment of a 2-year fellowship for graduate study in the use of bituminous materials and aggregates for bituminous paving mixtures. This fellowship has been made possible by the generosity of the New York State Bituminous Concrete Producers Association. Applicants for the spring term, 1954, are now being considered. Information about the fellowship may be obtained from Prof. Taylor D. Lewis, Lincoln Hall, Cornell University.

In recognition of the contributions to science of Selman A. Waksman, a postdoctoral fellowship, the **Waksman-Merck Postdoctoral Fellowship in the Natural Sciences,** has been established at Rutgers University by Merck and Co., Rahway, N.J. The Fellowship is open to citizens of the United States or Canada who have received or are about to receive the Ph.D. or equivalent degree and are interested in further training and research experience in biochemistry, chemistry, entomology, microbiology, nutrition, physics, physiology, or zoology as related to medicine and health.

The award is $4000 for one calendar year, beginning July 1, 1954. *The closing date for receipt of applications is Dec. 21, 1953.* The award will be made about Feb. 10, 1954. Application forms may be obtained from: Dean of the Graduate School, Rutgers University, The State University of New Jersey, New Brunswick, N.J.

In the Laboratories

The **Atomic Energy Commission** has announced that construction of the projected Spoon River explosives processing and assembly plant near Macomb, Ill., has been cancelled. This action was taken following technical developments which will considerably enlarge the output of already existing plants turning out the same products that would have come from the projected new plant. The future requirements of the atomic energy program in this line can be supplied, it has been established, by the present plants; hence construction and operating expenses for the planned Spoon River Plant may be saved. The net saving in construction and engineering costs is some $26,000,000. In addition, about $4,000,000 in start-up cost and $3,000,000 net a year in recurring operating costs will be saved. In announcing cancellation of the project, the Commission expressed its gratitude for the cooperation of all concerned, and especially of the contractors and communities in the area, and its regret for the inconvenience caused by the termination.

Cornell Aeronautical Laboratory, Inc., has announced that its large 2000 horsepower propeller dynamometer has returned to operation. Built and operated by Cornell Laboratory for the Air Force, the dynamometer has been inactive for several months due to a gear breakdown.

Meetings and Elections

By unanimous action of the Board of Directors of the **AAAS** at the meeting on Oct. 18, 1953, the following members were honored by election to Emeritus Life Membership: F. R. Watson, Walter Fred Hunt, Eugene Lindsay Opie, Charles H. Briggs, Paul Franklin Clark, and Harold Albert Wilson. Those elected to Emeritus Annual Membership were: Joseph A. Capps, Harrison Randall Hunt, Walter P. Taylor, and Roger C. Smith.

The **American Society for Engineering Education** has elected the following officers for 1953–54: pres., L. E. Grinter, University of Florida; treas., G. W. Farnham, Ronald Press Company; sec., A. B. Bronwell, Northwestern University; asst. sec., C. W. Watson, Northwestern University. The vice presidents are: B. R. Teare, Jr., Carnegie Institute of Technology; W. C. White, Northeastern University; W. L. Everitt, University of Illinois; and E. A. Walker, Pennsylvania State College.

The 5th Annual Meeting of the Brazilian Association for the Advancement of Science was held at Curitiba, State of Paraná, from Nov. 11 to 18, and included the following sections: Zoology, animal physiology,

pharmacology, pathology, botany, genetics, geology, chemistry and physics. Symposia were organized on electron microscopy applied to biology, chemical structure and biological activity, modern algebra, microanalysis of organic compounds, physical methods applied to biology, and statistical methods for industrial technology. Some of the symposia were specially concerned with problems of industrial development.

The **4th Annual Research Conference on Plant Physiology** was held at London, Ont., Nov. 2–3, 1953, with the University of Western Ontario and the Science Service Laboratory of the Department of Agriculture acting as joint hosts. These annual conferences are organized with the financial assistance of the National Research Council of Canada. Fifty-five scientists attended. They represented 12 universities and 14 government laboratories from five provinces. Nineteen papers were contributed from 16 laboratories on such varied topics as water relations in trees, plant nutrition, experimental morphology, enzymatic reactions, stomatal movement, and vernalization and flowering. An entire session was devoted to the presentation of 6 papers on various aspects of the metabolism of C^{14}-labelled compounds in both healthy and diseased plants.

Two invited speakers gave a comprehensive review of their fields of interest. C. S. Hanes, Department of Biochemistry, University of Toronto, spoke on the formation of peptides in enzymic reactions. He discussed various types of condensing reactions that have been isolated from plant and animal sources and explained how these bring about the coupling of amino acids into short chains by the formation of peptide or peptide-like linkages. Reactions of this type, he suggested, may be involved in the biosynthesis of protein. S. Aronoff, Institute of Atomic Research and Department of Botany, Iowa State College, spoke on the metabolism of soybean leaves. He described the effects of detachment and other treatments on processes such as photosynthesis, protein synthesis, and translocation, and discussed the results of these experiments from the standpoint of the specific functions of leaves and the biochemical interdependence between them and other plant "organs."

A **High-speed Computer Conference** will be held on the campus of the Louisiana State University, Jan. 28–30. This is the first time that a conference of this kind has been held in the South. It will draw its attendance from persons in business, research, engineering, and related professions from all over the nation. The conference is being sponsored by the university in cooperation with a number of business, accounting, research, and engineering organizations interested in high-speed computers.

The purpose of the meeting is to discuss the uses and applications of high-speed computers in business office procedures, statistical operations, and scientific and technical analyses. Electronic and other high-speed computing devices and equipment will be on exhibit during the meeting. Early registration will be appreciated; a registration fee will be charged. Those desiring more detailed information should write directly to Mr. Leon Megginson, Louisiana State University, Baton Rouge.

The **3rd National Symposium of the Division of Organic Chemistry, Chemical Institute of Canada,** will be held at McGill University, Mar. 8–9, 1954. G. E. McCasland of the University of Toronto is Division Chairman.

Heading the speakers' list will be Nelson Leonard of the University of Illinois, who is secretary of the Organic Division of the American Chemical Society, and Raymond Lemieux of Saskatchewan. Dr. Lemieux will be awarded a special citation in honor of his recent achievement in synthesizing sucrose. The full symposium program will be announced at an early date.

Accommodations will be available at the Sheraton-Mount Royal Hotel (official hotel). Hotel reservation requests should be sent well in advance to the division secretary, Alfreds Taurins of McGill University, who will gladly furnish further information on matters of housing, registration, or transportation.

This will be the third biennial symposium of the Organic Division, C.I.C. Symposium papers, presented by invitation, usually review recent progress in certain relatively broad fields of organic chemistry, thus differing from the short research papers given at the C.I.C. annual June conference.

The 4th annual **Rochester conference on high energy nuclear physics** will be held at the University of Rochester, Jan. 25–27. Participants in the conference, sponsored by the University of Rochester, the National Science Foundation, and a group of Rochester industries, will include leading research workers in the high energy physics laboratories of the United States, Canada, Mexico, England, and Europe. The conference will be under the direction of Joseph B. Platt, Acting Chairman of the university's Physics Department. The director of the previous Rochester conferences, Robert E. Marshak, is this year Visiting Professor of Physics at the Sorbonne, France, on leave of absence from Rochester.

The purpose of the conference is to bring together a representative group of active workers in the field of high-energy physics for an informal discussion of the latest experimental results and their interpretation. Among the topics scheduled to be considered are nucleon scattering, nucleonic production of mesons, multiple meson production, new unstable particles, and photo-mesic production. A complete record of the conference proceedings will be made available to high energy physics laboratories throughout the world within a month after the meeting.

More than 100 scientists, including four Nobel prize winners, representing 46 research institutions, 17 states, and 9 foreign countries, attended the last Rochester high energy physics conference held in December, 1952.