varied research programs. This type of reactor gives a very high neutron flux per unit power over a small region. The use of this particular design of a water-boiler-type reactor is somewhat limited because of its low power rating. However, with suitable design changes, the power rating can be increased many-fold so that a neutron flux of 10^{12} neutrons/cm^2 sec is easily obtainable.

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News and Notes

Heavy-Water Reactor Conference in Oslo, Norway

AN international Conference on Heavy Water Moderated Nuclear Reactors was held in Oslo and at Kjeller, Norway, Aug. 11–13. The Conference was sponsored by the Dutch-Norwegian Joint Establishment for Nuclear Energy Research (JENER). There were about 100 participants, with representatives from most countries in the Western World. The program consisted of papers on reactor design and construction, kinetics and control, and neutron physics. Ample time was provided for discussions.

In his opening address G. Randers (JENER) discussed the possible use of heavy-water reactors in industry. Since most European countries are unable to procure enriched fuels at the moment and since even natural uranium is scarce and relatively expensive, a good moderator becomes essential. Furthermore, the geometry of the reactor must allow an initial reproduction factor which is adequate for a 1% burn-up of the fuel. Thus the call for a heterogeneous heavy-water moderated natural-uranium reactor. Design studies for such a reactor to produce 5000 kw of electricity are being made at Kjeller.

J. V. Dunworth (A.E.R.E., Harwell, England) underlined the advantages of using heavy-water as moderator in general. He maintained, however, that with the present high price of heavy-water it is difficult to make an electricity-producing reactor-plant which competes favorably with conventional plants. Where there is a need for a small, compact system the situation is more favorable.

As a pleasant break in the discussions on future reactors, J. M. West (Argonne, U.S.A.) described the latest Argonne research reactor CP-5. This reactor is a result of the experiences gained at Argonne with their earlier heavy-water moderated research reactors CP-3 and CP-3′. The latter reactors were described in a later session by West from a paper prepared by S. McLain. CP-3, which operated from early 1944 to early 1950, contained natural uranium as fuel. CP-3′ and CP-5, on the other hand, contained enriched fuels. The maximum slow neutron fluxes were for CP-3 about 10^{12} cm^{-2} sec^{-1}, for CP-3′ at 275 kw $3{,}4 \times 10^{12}$ and for CP-5 a calculated average thermal flux at 1000 kw of 2×10^{13}. The reason for using enriched fuel in the latter reactors is to obtain a greater fission rate per unit mass of fissile material. Heavy-water is preferred to light-water as moderator due to the larger reactor core for experimentation and the longer lifetime of slow neutrons. This makes the problem of control easier.

In a paper on the past, present, and future of heavy-water reactors L. Kowarski (Saclay, France) stressed that a greater excess reproduction factor can be obtained with a heavy-water moderator than with a graphite moderator. As a result the reactor is easier to construct and to run. In a situation where the abundance of pure fissile materials is low, the natural-uranium heavy-water system offers the best solution as a power reactor. This situation may, according to the speaker, last for more than 20 years.

A. M. Weinberg (Oak Ridge, U.S.A.) presented a description of the A.E.C. materials testing reactor (MTR) from a paper written by S. McLain. This reactor was designed so as to maximize the fast neutron flux. In order to achieve this it is necessary to make the power per unit cross-section for scattering of fast neutrons as high as possible. The volume of the reactor core for a given power is therefore made as small as possible. Highly enriched uranium-235 is used in the core and beryllium is used as reflector. At 30,000 kw the flux of uncollided fission neutrons is of the order of 10^{14} and the average slow neutron flux is 2×10^{14}. Weinberg also described briefly the Swimming Pool Reactor and the Homogeneous Reactor Experiment at Oak Ridge. The strong coupling which exists between the temperature and power in the latter reactor was discussed.

Some of the reactor projects in Europe were also treated briefly. L. Kowarski described the Saclay reactor, which is a natural-uranium–heavy-water reactor which is cooled by blowing compressed nitrogen gas along the rods. J. Bernot gave an account of the cooling system. O. Dahl (Norway) and P. Scherrer and W. Zünti (Switzerland) presented the plans for heavy-water moderated and cooled natural-uranium reactors with a heat generation of the order of 10,000 kw. S. Eklund (Sweden) gave some details of the

nearly completed research reactor in Stockholm. Finally M. Bustraan (JENER) reported on some calculations on thermal breeding by M. Bogaardt and himself.

The session on reactor kinetics and control began with a paper by A. Lundby (JENER) on the time behavior of the Kjeller research reactor (JEEP). From experiments by the speaker and N. Holt on the response of the reactor to step function changes in reactivity the average lifetime of a neutron. in the reactor was found to be about 2.10^{-3} sec. The effect of the delayed photoneutrons was dealt with.

V. O. Eriksen (JENER) described measurements and calculations by W. Hälg and himself on the Xe-135 poisoning in the reactor. After about 2 days operation at 250 kw the Xe-135 suppresses a reactivity of about 2.10^{-3}.

A theoretical paper by W. K. Ergen and A. M. Weinberg on some aspects of nonlinear reactor dynamics was presented by Weinberg. The high power densities and large excess reactivities in more recently constructed reactors lead to a strong coupling between temperature and reactivity. The power in such reactors may change so rapidly that the stability of the system must depend on this coupling rather than on relatively slow acting control rods. Under the assumption of a negative temperature coefficient of reactivity the response of a reactor was calculated for different ways of extracting the heat.

V. Raievski (Saclay, France) reported on reactivity measurements with a subcritical reactor and compared them with results obtained by measuring the stable period of a supercritical reactor. The session was closed by a description of the control system of JEEP by K. P. Lien (Norway).

The last day of the Conference was devoted to neutron physics. A great number of short papers were given. The main speakers were J. A. Goedkoop (JENER) who reviewed beam experiments with JEEP, B. B. Kinsey (Canada) who discussed some results of recent gamma-ray studies at Chalk River, and P. A. Egelstaff (England) who gave results of measurements of pile spectra and cold neutron scattering experiments besides describing the fast chopper in Harwell. G. Randers closed the Conference by proposing the foundation of an International Nuclear Energy Society. The participants of the Conference agreed to this and suggested the establishment of a preliminary committee to work out further organizational details. The aims of the Society would be to distribute information (possibly through a periodical) organize meetings and standardize the nomenclature and symbols used in the field.

ARNE LUNDBY

Dutch-Norwegian Joint Establishment for Nuclear Energy Research
Oslo, Norway

Science News

Two responses evoked by **President Eisenhower's atomic proposals** to the United Nations are as follows.

Watson Davis, Director of Science Service, indicated that the chief value of the speech was that it provided an initial step toward cooperation, that the prime facts revealed were psychologic and diplomatic for, if Russia adopted all the Eisenhower proposals tomorrow, it would not remove the danger of atomic war. Mr. Davis pointed out that the President mentioned specifically "fissionable materials," which would not include the tritium, deuterium, or ordinary hydrogen that presumably is used in superbombs.

The Federation of American Scientists issued a strong statement of endorsement saying that the proposal for an international agency to develop constructive possibilities of the atom "would evoke enthusiastic support and willing service from most scientists and engineers." But the statement warned that "the road to abundant, useful atomic power is yet long and hard," and said that both the United States and the Soviet Union could profit by cooperation.

A survey published in the Dec. 7 issue of *Chemical and Engineering News* shows **increasing nuclear energy** activities in the countries of the free world. Further, the enormous budgets of the major powers do not discourage smaller countries, according to Gunnar Randers, director general of the Norwegian-Dutch reactor at Kjeller, Norway. He believes most of the large expenditures have given results now sufficiently well known to save similar expenses for others. By concentrating on a project of particular interest, a small country can turn out specific results that compare favorably even with those of the United States.

The survey shows that nonmilitary nuclear energy projects are under way or well along in planning in Norway, the Netherlands, Belgium, France, India, and Switzerland. These newcomers to the field are emphasizing either electric power from nuclear energy or radioactive tracers for chemical and medical research. There are also plans for power plants in Australia and Brazil. Germany is anxious to get into the field, but is still restricted by an Allied ban. In addition, the European Nuclear Research Center to be located in Switzerland will pool the resources of Belgium, the Netherlands, France, Britain, West Germany, Greece, Italy, Sweden, Denmark, Norway, Yugoslavia, and Switzerland. Another international group may be formed soon, the International Nuclear Energy Society; it would include participants from 19 countries and would attempt to distribute information, organize meetings, and standardize atomic nomenclature and symbols.

The **Government of India** is making an effort to raise the country's standard of living substantially, by means of atomic energy. A project has been inaugurated to convert soil with a high monazite content, plentiful in South India, into nuclear fuel. In

monazite there is 9% of radioactive thorium, and through an atomic pile this can be converted into energy. The reaction must first be started by the use of uranium, of which India has an adequate supply.

The program was discussed by H. J. Bhabha, of the Tata Institute of Fundamental Research and chairman of the Indian Atomic Energy Commission, at an international conference on theoretical physics in Japan. Prof. Bhabha described the work being carried out by hundreds of scientists from India as well as by many brought from overseas.

A special research center has been set up in Bombay in what was formerly an army installation. Foreign observers who have seen the plans and the work already in progress are greatly impressed with the way the Indian atomic project is being conducted. They point out that the Indians have the advantage of concentrating all their fissionable resources on a program for industrial use, whereas other countries have stressed the destructive aspects in the production of atomic energy.

In December the **Atomic Energy Commission** renewed its invitation to private industry to submit proposals for the investment of risk capital in the recently announced project to build a full-scale nuclear reactor for generating electric power. The AEC is proceeding as rapidly as possible with necessary decisions on architect-engineering considerations, site selection, and operating specifications. Companies or organizations interested in participating should submit proposals, *prior to Feb. 15,* to AEC Reactor Development Division, Washington, D.C.

The Geological Survey now possesses a modern **"atomic clock"** for dating mineralogical, archaeological, and prehistoric plant and animal remains. This clock, based on measurements of the natural radioactivity of carbon 14, is the invention of W. H. Libby of the University of Chicago. Its use offers one of the most fascinating achievements of the atomic age, and for the Survey has opened an entirely new approach to the study of the earth's past, especially glacial and postglacial times.

Atomic clocking is based on the observation that radioactive carbon 14, being manufactured constantly from the nitrogen in the atmosphere through cosmic ray bombardment and assimilated as carbon dioxide by living things all during life, provides a known fraction of tagged atoms whose rate of decay can be checked to determine, within certain limits, how long ago a given plant or animal lived. As long as an organism is alive, a balance is maintained between radioactive carbon and the ordinary variety. New radiocarbon is added as fast as the old disappears. When life ends no more is added, and in death the carbon timeclock begins to run down. Thus each piece of wood, for example, provides evidence of its absolute age, in addition to the evidence yielded by the calendar of its annual rings, which is limited to the life span of the tree from which it came.

Dr. Libby's ingenious method involves the measurement of the very low radioactivity remaining in the carbon of, say, wood, bone, or seeds, when placed within a special arrangement of Geiger counters. The half life of carbon 14 is 5568 years. Age determinations up to 20,000 years are fairly commonplace today, but beyond this point accuracy falls off swiftly.

The Department of Interior's clock is a modification of the Libby method and was developed by Hans Suess, Geological Survey physical chemist. It further reduces the carbon to acetylene gas, which can be introduced into a Geiger counter without allowing contamination by air molecules.

The General Electric Company has developed a powerful mechanical arm, named **O-Man** (for overhead manipulator), for use in radioactive areas where men could not survive. The machine was designed for the G-E Aircraft Nuclear Propulsion Department which is constructing an atomic aircraft engine under the sponsorship of the Atomic Energy Commission and the Air Force. O-Man's operator will run the controls from behind special glass windows, aided by binoculars or a telescope. The machine's chief function will be to pick up heavy parts, position them, and fasten them into place. It can drill and tap holes, use power wrenches, hammers, or riveters, and if need be, can handle a sheet-metal saw.

The first hospital designed specifically for atomic-age treatment, the **Argonne Cancer Research Hospital** at the University of Chicago, is the subject of an article by Robert Goldstein in *Today's Health* (Nov., 1953). The Atomic Energy Commission provided $4,200,000 for construction and will continue to defray operating expenses of approximately $1,000,000 a year. The main function of the hospital is to learn how radiation can help control cancer. Only two of the building's eight floors are for patient care. Two floors are devoted solely to fundamental research. Leon O. Jacobson, professor of medicine at the university and director of the hospital, emphasizes that the entire program comes under the heading of research.

The hospital has unusual safety factors such as 8-in. concrete walls, plastic floors, and lead isotope containers that fit inside stainless steel tubes extending 8 ft below the basement floor. Investigators watch certain operations through 3-ft thick windows containing a solution of zinc bromide. Five of these windows cost $10,000. Further, a health physics section establishes safety methods and is responsible for checking patients, personnel, and laboratories for contamination.

The institution is being equipped with a wider range of high-energy radiation machines than any other in the world. Nearly 300 untried radioisotopes will be evaluated and tested. Many of them are radioactive for very short periods, but isotopes can be delivered quickly from nearby Argonne National Laboratory.

One of the new devices to be used is the cobalt 60

"bomb," which is 1800 times more powerful than 1 g of radium and is equivalent to a two-million-volt x-ray machine in producing energy. The "bomb," like several other instruments being tested, is equipped so that it can be rotated around the patient. Extensive research will also be conducted on radioactive tracer techniques. The hospital's facilities will be available to the Argonne National Laboratory and to 32 Midwest universities and other research institutions that are participating members of the laboratory.

An article in *The Merck Report* **62,** 7 (Oct., 1953) entitled "**Atomic Energy for Human Diseases,**" by John T. Godwin, Head of the Division of Pathology, Brookhaven National Laboratory, outlines the following research.

Investigation of possibilities of the use of short half-life isotopes and thermal neutrons in humans at the hospital of the Brookhaven National Laboratory has been carried out with the few radioactive isotopes found useful in human diseases. Radioactive phosphorus (P^{32}), produced through bombardment of stable P^{31} or S^{32} by neutrons, with a half life of 14.3 days, is considered the agent of choice in the treatment of polycythemia rubra vera. Administration may be orally or intravenously. Effects of a single dose are evident in approximately two months. Vascular complications such as hemorrhage and thrombosis are reduced.

Radioactive iodine (I^{131}), a by-product of uranium fission, has a half life of 8.14 days and decays to stable xenon 131. This isotope has been used extensively in both the diagnosis and treatment of certain thyroid diseases. It is selectively concentrated in the thyroid colloid. It has been found useful in reducing the thyroid in patients with cardiac disease, and diffuse hyperplasia (Graves' disease), nodular hyperplasia, and in certain types of metastatic thyroid carcinoma. In cases where surgery has failed, or is not indicated, radioactive iodine has been effective in the management of hyperthyroidism. An undesirable side effect is hypoplasia of the bone marrow. The potential carcinogenic effect of iodine 131 in patients treated for hyperthyroidism has not yet been elucidated.

The short half-life isotopes are at present under investigation. Radioactive chlorine (Cl^{38}), produced in the nuclear reactor by neutron bombardment of pure ammonium chloride, has a half life of 37.3 min. A small number of cases have been treated in an attempt to reduce pleural and peritoneal fluid accumulations in pleural metastases of breast carcinoma and in peritoneal implants of ovarian adenocarcinoma. Reduction of fluid has been obtained in some of these cases. There was evidence of radiation effects on the pleura and peritoneum, with damage to the tumor; in one case there was hypoplasia of the bone marrow. Radioactive gold (Au^{198}), produced by neutron bombardment of elemental gold, has a half life of 2.7 days and decays to stable mercury 199. It has been used in a colloidal state, intrapleurally or intraperitoneally for metastatic carcinoma, in an attempt to diminish the accumulation of fluid. Some success, although little actual tumor destruction, was observed.

The application of the capture of thermal neutrons by boron atoms of mass 10, with a very high thermal neutron-absorption cross section, has been investigated in 10 cases of glioblastoma multiforme, since it was found that boron initially concentrates in certain brain tumors to a significantly greater degree than in the surrounding brain. E.M.L.

Nuclear energy has provided new **research tools for dentistry** that point the way to increased knowledge of tooth structure and dental disease and treatment, according to five reports appearing in a recent issue of *The Journal of the American Dental Association.* Research projects in the field have been completed or are in process in 17 institutions, including dental schools, the National Institute of Dental Research, and institutions of the armed forces. Some 21 radioactive compounds have been used in investigations.

"The developments which have occurred since 1945, when radioactive compounds were released in large quantities from the uranium pile at Oak Ridge, have each year brought new developments in dentistry," the *Journal* said, "and it appears now that dental institutions will need to establish radioisotope laboratories where graduate students can be trained in the use of these new tools of dental science."

Scientists in the News

Daniel H. Basinski of The Child Research Center of Michigan, Detroit, has recently accepted a position as associate biochemist in the Department of Laboratories at Henry Ford Hospital.

Herman Blaschko of Oxford University joined the Department of Pharmacology of the Yale School of Medicine in September as visiting lecturer and research associate. His work on the amine oxidases and on various aspects of amine metabolism has been of great importance. At Yale, studies initiated at Oxford by Dr. Blaschko and Arnold D. Welch on the concentration of epinephrine within cytoplasmic particles of the adrenal medulla will be continued.

The Navy has presented its highest civilian award, the Distinguished Public Service Award, to three research scientists of the Hercules Powder Company, Wilmington, Del., for "exceptional contributions to the United States Navy" by developing new propellants for guided missiles. Recipients of the awards were: **Lyman G. Bonner,** technical director of the Rocket Development Department at Allegany; **Ralph F. Preckel,** a research group supervisor; and **Richard Winer,** chief of the Rocket Development Department.

D. M. Brown has been promoted to the position of head of the Department of Data Reduction and Computation, Willow Run Research Center, University of Michigan.

D. Eugene Copeland, for the last 3 years on leave

of absence from Brown University to the Office of the Surgeon General, USAF, has been appointed professional associate in the Division of Medical Sciences, National Research Council, to be associated with the Committee on Growth.

William B. Deichmann has resigned as professor of pharmacology at the Albany Medical College to accept an appointment as professor and director of the Department of Pharmacology at the University of Miami School of Medicine, effective Oct. 1.

C. M. Hebbert, who has retired from his position at the Bell Telephone Laboratories, has been appointed to a professorship at the Polytechnic Institute of Brooklyn.

The American Society of Anesthesiologists has elected **Dennis Jackson,** professor emeritus of pharmacology at the University of Cincinnati, to honorary membership in recognition of his service to the profession. In 1915 Dr. Jackson developed in experiments with animals the basic techniques now used for human anesthesia. The Society's distinguished service award this year went to **Charles F. McCuskey** of Los Angeles, past president of the American Board of Anesthesiology.

D. T. O'Connor, chief of the Radiology Section, U.S. Naval Ordnance Laboratory at White Oak, Md., was awarded the First Annual William D. Coolidge Award as the author of the outstanding paper of the year on x-rays. The award was made jointly by the Society for Non-Destructive Testing and the X-Ray Department, General Electric Company. Mr. O'Connor's paper, entitled "Industrial Fluoroscopy," was published in the journal of the Society, and was presented at last year's session as the Mehl Lecture by which the Society honors outstanding members.

Jean Redman Oliver, professor of pathology in the College of Medicine at New York City, State University of New York, has been named the first Distinguished Service Professor of the University. Dr. Oliver, who has the longest record of service of any full professor on the faculty, will retire next spring after an association of 24 years. He is well known for his work in renal pathology, and is at present on leave from the University to conduct research for the U.S. Army Epidemiological Board on the renal lesions caused by epidemic hemmorhagic fever, a disease that has assumed considerable importance in connection with the troops in Korea. Until he accepted this current assignment, which is being carried out in Overlook Hospital, Summit, N.J., Dr. Oliver had been chairman of the Department of Pathology since 1929.

Russell L. Perry, of the University of California Department of Agricultural Engineering at Davis, assumed new duties Sept. 1 on the university's Los Angeles campus. Dr. Perry, who has been on the Davis campus for 25 years, transferred to U.C.L.A. as a specialist in agricultural engineering but remains on the agricultural engineering faculty at Davis. He will be attached to the College of Engineering at Los Angeles.

Robert M. Salter has transferred, for reasons of health, from the position of chief of the Soil Conservation Service to a post in charge of Soil and Water Conservation Research in the Agricultural Research Service. **Donald A. Williams** has been appointed acting administrator of the Soil Conservation Service. Mr. Williams has been in charge of the Agricultural Conservation Program since February and before that was assistant chief of the Soil Conservation Service.

E. W. R. Steacie, president of the Canadian National Research Council, was Baker lecturer in chemistry at Cornell University from November 10 to December 15. Dr. Steacie lectured on "Photochemical and Free Radical Reactions."

H. W. Stunkard, of New York University, completed his second five-year term as Chairman of the Editorial Committee and Managing Editor of the *Journal of Parasitology,* at the end of 1953. He will be succeeded by **George R. LaRue,** Bureau of Animal Industry, U.S. Department of Agriculture, Beltsville, Md. All manuscripts submitted to the *Journal* after Jan. 1 should be addressed to Dr. LaRue.

Education

Cornell University hopes to have its new high-voltage laboratory, replacing one destroyed by fire in 1948, in full operation within approximately a year. The massive windowless building of more than a half-million cubic feet will have a testing bay that occupies most of its space. Railroad cars will run onto the testing floor to unload transformers, insulators, and other heavy equipment.

The center, which will be directed by Stanley W. Zimmerman, will be capable of testing to destruction almost any electrical insulator. Fifteen-ton transformers will be able to produce 1,000,000 v, single phase, or 600,000 v, three phase. Capacitor networks will permit electrical surges as high as 3,000,000 v, with currents exceeding 25,000 amp. Engineers will be able to simulate a wide variety of conditions and to produce "standard" lightning strokes. Both man-made and natural lightning will be subjected to measurement. The laboratory will also be used for the investigation of undesirable corona.

The **Division of Tribophysics, Commonwealth Scientific and Industrial Research Organization,** East Melbourne, Australia, has moved into a new building on the grounds of the University of Melbourne. The Division was started during the war to assist with purely practical problems arising from wartime engineering difficulties. However, it has become a recognized authority on certain aspects of lubrication and bearing design, and has given a good deal of advice

to industry. Also, since surprisingly little is known about what happens when metals are subjected to such operations as cutting, rolling, pressing, and extruding, much of the Division's work lies in this field, and the new building has been designed and equipped with this in mind.

Grants, Fellowships, and Awards

The Nebraska Academy of Sciences has awarded the **1952 AAAS Research Grant** to R. C. Lommasson of the Department of Botany, University of Nebraska, for his research project on the measurements of internal tissues of cereals.

The Commonwealth Fund annual report lists the following research grants for 1953 (for British and "Salzburg" fellowships, see SCIENCE **118,** 178):

University of Alabama. R. J. Bing, Medical College of Alabama. Physiological studies of the heart and circulation.

University of California. H. W. Magoun, School of Medicine. Study of functional interrelationships between the brain stem and cerebral cortex.

University of Chicago. I. Gersh. Histochemical studies of the submicroscopic organization of cells and of extracellular substances.

University of Chicago. H. Klüver. Study of the porphyrins.

University of Colorado School of Medicine. A. H. Washburn, Child Research Council. Study of growth and development.

Cornell University Medical College. M. G. Wilson, New York Hospital. Study of rheumatic fever.

Harvard Medical School. W. Bauer, Massachusetts General Hospital. Study of arthritis.

Harvard Medical School. F. Lipmann, Massachusetts General Hospital. Studies of cellular metabolism.

Harvard Medical School. N. B. Talbot, Massachusetts General Hospital. Pediatric endocrinological studies.

Harvard Medical School. M. D. Altschule, McLean Hospital. Physiological studies of the pineal gland, with particular reference to the psychoses.

Harvard Medical School. D. Hume, Peter Bent Brigham Hospital. Study of the control of pituitary function.

Harvard University. A. Weinstein. Genetic studies of the mechanism of crossing over.

New York University. H. Teuber, College of Medicine. Studies of cerebral function.

New York University. R. Chambers. Synthesis of studies of the living cell.

University of Pennsylvania School of Medicine. T. N. Harris, Children's Hospital. Study of the mechanism of antibody formation.

University of Pennsylvania School of Medicine. S. S. Cohen, Children's Hospital. Chemical studies of virus formation.

University of Pennsylvania School of Medicine. M. B. Lurie, Henry Phipps Institute. Studies of resistance and susceptibility to experimental tuberculosis.

Tulane University. R. G. Heath, School of Medicine. Studies of schizophrenia.

Washington University. P. Heinbecker and C. A. Moyer, School of Medicine. Studies of physiological controls centering in the pituitary gland.

Yale University. M. J. E. Senn, Child Study Center. Study of emotional development in early childhood.

Advanced Fellowships in Medicine and Allied Fields

P. W. Guilbert, University of Montreal Faculty of Medicine. Nutritional research, Dept. of Pediatrics, Univ. of Pennsylvania School of Medicine, 2 yrs.

G. B. Odell, Yale University School of Medicine. Metabolic disorders in children, Dept. of Experimental Medicine, Univ. of Cambridge, 1 yr.

S. Reichlin, Washington University School of Medicine. Neuro-endocrinology, Institute of Psychiatry, University of London, 2 yrs.

M. W. Spellman, Howard University College of Medicine. Third year of surgical training, University of Minnesota Medical School.

P. K. Munter, Columbia University College of Physicians and Surgeons. Psychiatry, Massachusetts Institute of Technology, 1 yr.

J. Cumming, University of Toronto Faculty of Medicine. Community health problems, Dept. of Social Relations, Harvard University, 2 yrs.

R. L. Gilmer, Stuart Circle Hospital School of Nursing. Advanced psychiatric nursing, Columbia and Maryland universities, 1 yr.

G. Lindzey, Harvard University. Didactic psychoanalysis, Boston Psychoanalytic Institute.

R. T. Scholes, University of Rochester School of Medicine. Sociological and anthropological factors of health problems, University of Chicago, 6 mos.

E. G. Dreyfus, Harvard Medical School. Public health and social science, Dept. of Social Relations and School of Public Health, Harvard University, 1 yr.

The **Damon Runyon Memorial Fund** made the following research grants during November:

Institut Jules Bordet, Brussels, Belgium. H. J. Tagnon. Cancer research, $10,000.

Hospital de Enfermedades de la Nutricion, Mexico. G. Montano. $5000.

Cancer Society of Finland. Cancer research, $5000.

University of Rochester. D. S. Tarbell. Carcinogenic action of 3,4-benzpyrene, $7500.

Mount Zion Hospital, San Francisco. B. L. Freedlander. Chemotherapy of experimental mouse tumors, $7400.

Ohio State University. C. A. Doan. Investigations on urinary adrenocorticosteroids, $4500.

Jefferson Medical College. C. W. Wirts. Gastric cancer detection studies, $5000.

J. Heyman, Radiumhemmet, Sweden. Annual report on the results of treatment of carcinoma of the uterus, $1000.

International Congress of Clinical Pathology. Support of third congress, $2500.

National Committee of the International Union Against Cancer. To sponsor representatives to VIth Congress in Brazil, $3000.

Columbia University. G. Godman. Renewal fellowship, $4200.

The General Electric Company, for the eighth consecutive year, will offer 50 preparatory and high school physics teachers from north central states, a special 6-week study program at Case Institute of Technology. Teachers from the following states may apply: Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, Minnesota, Ohio, Western Pennsylvania, Tennessee, West Virginia, and Wisconsin.

Applicants for **General Electric Science Fellowships** must be college graduates, must possess experience in preparatory or high school science teaching, and must be certified to teach in their respective states.

The all-expense fellowship program will run from June 20 to July 30, 1954. Fellowship funds will cover living expenses on the Case Tech campus, books, tuition, fees, and travelling expenses to and from Cleveland.

The University of Wisconsin invites professors to nominate from among their students in the natural sciences, including engineering, young men and women of unusual ability as candidates for the **Wisconsin Alumni Research Foundation Assistantships.** These awards carry a stipend of $1500 for the period July 1, 1954, to June 30, 1955, with one month vacation; in special cases, awards will be made for the academic year with compensation of $1250 for this shorter period. In addition to the salary, recipients of these awards are exempt from payment of the non-resident tuition of $320 for the year, but are required to pay the general fee of $90 per semester required of all

students. The assistantships are renewable for a second year.

Recipients of these awards are free to select their research problem in consultation with their major professors. They will, of course, be registered in the Graduate School and will receive full residence credit toward the graduate degree. Candidates in chemistry who wish to be considered for appointment in other fields that make extensive use of chemistry, such as bacteriology, biochemistry, botany, physiology, pharmacology, soils, and zoology, are requested to give their alternative choice in filling out the application blank. For graduate work beginning June 28 or Sept. 20, 1954, *applications should be received by Feb. 15, 1954.*

Meetings and Elections

The **American Association of Colleges of Pharmacy** has elected the following officers for 1953–54: pres., Edward C. Reif, University of Pittsburgh; pres.-elect, Joseph B. Burt, University of Nebraska; v. pres., Kenneth L. Waters, University of Georgia; chairman of executive committee, Louis C. Zopf, State University of Iowa; sec.-treas., Richard A. Deno, University of Michigan.

The **American Academy for Cerebral Palsy** has elected the following officers for 1954: pres., Meyer A. Perlstein, Chicago, Ill.; pres.-elect., Lenox D. Baker, Durham, N.C.; sec.-treas., Harry E. Barnett, Chicago, Ill.

The **American Institute of Chemical Engineers** has elected the following officers for 1954: president, Chalmer G. Kirkbride, Houdry Process Corp., Philadelphia, Pa.; v. pres., Barnett F. Dodge, Yale University; treas., George Granger Brown, University of Michigan; sec., Stephen L. Tyler.

Officers for the **American Medical Writers' Association** for 1954 are: pres.-elect, Lee van Antwerp, Chicago, Ill.: 1st v. pres., W. W. Bauer, Chicago, Ill.; 2nd v. pres., Stewart Wolf, Oklahoma City, Okla.; sec.-treas., Harold Swanberg, Quincy, Ill. The president for 1954, elected last year, is Jacob E. Reisch, Springfield, Ill.

The **American Society for Professional Biologists** has elected the following officers for 1954: pres., John M. Hale; pres.-elect., Austin W. Morrill, Jr.; treas., Ronald N. Wood. The new vice presidents are John R. Walker, Stefan Ansbacher, Dale Lindsay, and George Foley.

The **Botanical Society of America** has elected the following officers for 1954: pres., Adriance S. Foster, University of California; v. pres., Oswald Tippo, University of Illinois; treas., Harry J. Fuller, University of Illinois; sec., Harriet B. Creighton, Wellesley College.

The **Committee for the Scientific Study of Religion** held its fall meeting at Harvard University on Nov. 21. A program of papers in the fields of anthropology, psychology, and sociology was presented. The next meeting was set for April 10 in New York. Social scientists with empirical research to report in the area of religion should submit, *by Feb. 15,* three copies of an abstract, not over three hundred words, to Dr. David Barry, National Council of Churches, 297 4th Ave., New York 10. For membership information write the secretary, Dean W. H. Clark, Hartford School of Religious Education, Hartford 5, Conn.

Initial steps have been taken for the formation of the **National Pharmaceutical Council, Inc.** The founding group of the new organization met in Atlantic City on Dec. 1–2, 1953. The announced purposes of the Council are:

To benefit public interest by promoting the highest professional standards in the manufacture, distribution, and dispensing of prescription medication and other pharmaceutical products.

To benefit the pharmaceutical industry by promoting public relations programs on behalf of pharmacists and others in the industry.

To promote the interests of the public, physicians, pharmacists, and others in the pharmaceutical industry by encouraging the highest standards of ethics and integrity in the manufacture, distribution, and dispensing of prescription medication and other pharmaceutical products.

To collect and disseminate information concerning laws, regulations, and governmental agencies dealing with the manufacture, distribution, and dispensing of prescription medication and other pharmaceutical products as a contribution to the better understanding thereof in the public interest.

Member companies in the new organization are: Abbott Laboratories; Ciba Pharmaceutical Products, Inc.; Hoffmann-LaRoche, Inc.; Lederle Laboratories; McNeil Laboratories, Inc.; The William S. Merrell Co.; Pfizer Laboratories (& J. B. Roerig & Co.); G. D. Searle & Co.; Smith, Kline & French Laboratories; E. R. Squibb & Sons; The Upjohn Co.; and Winthrop-Stearns, Inc.

Theodore G. Klumpp was elected president, and the vice presidents are L. J. Barrett, Franklin P. O'Brien, O. J. May, and Henry Wendt, Jr. John Bradley and L. J. Sichel are secretary and treasurer, respectively.

A Symposium on Orthopteran Acoustics will be held April 5–8, 1954, at the Laboratoire de Physiologie Acoustique de l'Institut National de la Recherche Agronomique, Jouy-en Josas (Seine & Oise), France. Certain specialists have been asked to act as reviewers and give general expositions, notably: for Germany, H. Autrum, University of Würzburg and W. Jacobs, University of Munich; for England, R. J. Pumphrey, University of Liverpool; for Italy, E. Benedetti, University of Parma; for the United States, H. Frings, Pennsylvania State College. Inquiries should be addressed to the Laboratoire de Physiologie Acoustique.

Miscellaneous

The urgent need by official agencies for scientific information on disaster problems and the opportunity to foster basic scientific work in a variety of fields have caused the National Academy of Sciences—National Research Council to set up a Committee on Disaster Studies under the Council's Division of Anthropology and Psychology. Because of the increasing interest in disaster research, the many disciplines involved, and the great need for exchange of information in this field, the Committee has established a **Clearinghouse for Disaster Studies.** The Committee would like to receive available reprints and reports, especially unpublished reports, on disaster studies, or related research, and would appreciate communication with the investigators of any "in-progress" studies. The Clearinghouse will then be able to make available a currently useful reference source. Information should be directed to the Committee on Disaster Studies, National Academy of Sciences, 2101 Constitution Ave., Washington 25, D.C.

The following **chemicals** are wanted by the Registry of Rare Chemicals, Armour Research Foundation of Illinois Institute of Technology, 35 W. 33 St., Chicago, Ill., 16: N-methyl-6(1)-pyridone-3-carboxamide; 2,1,3,4-tetrazole-5-carboxylic acid; cis-diphenylethylene oxide; 4-methoxyproline; 1-methylxanthine; capsaicin; cinchol: kynurenine; L-limonene; gymnemic acid; 6-methylindole; 1,4-dibromo-2-butyne; 3,5-dihydroxycinnamic acid; pyrazine-2.3-dicarboxylic acid; 4-methyltryptophane; glycyrrhetinic acid; amygdalin; delta-tocopherol; ornithuric acid; and protoanemonin.

At its 1952 meeting in Rome, the International Astronomical Union undertook the project of issuing a revision of *Astronomical Observatories and Astronomers,* the last edition of which came out in 1936. This publication lists official observatories, astronomical societies, and periodicals dealing with astronomy. As in the past, the Royal Observatory of Belgium will assume the editorial work. At present it is distributing questionnaires. All astronomical institutions that have not received the questionnaire by Jan. 1, 1954, should request one from the Observatoire Royal, Uccle-Bruxelles, Belgium.

Necrology

Augustine J. Annunziata, 54, head of the Pediatrics Department of Mother Cabrini Hospital, New York, N.Y., Nov. 19; **Sir Lancelot Barrington-Ward,** 69, surgeon, London, England, Nov. 17; **E. Bataillon,** 85, experimental embryologist and professor emeritus of zoology, University of Montpellier, France, Nov. 1; **Carl E. Buck,** 62, professor of public health at the University of Michigan School of Public Health, Ann Arbor, Mich., Nov. 21; **George P. Burns,** 82, professor emeritus and former chairman of the Department of Botany, University of Vermont, Burlington, Vt., Nov. 14; **Edward H. Cary,** 81, former president of the American Medical Association and dean of the Baylor Medical School, Houston, Tex., Dec. 11; **Paul S. Clapp,** 63, retired electrical research engineer, New York, N.Y., Dec. 5; **Clarence E. Earle,** 60, inventor and former chief of the Chemical Research and Development Section, Bureau of Aeronautics, Washington, D.C., Nov. 25.

K. George Falk, 73, biological chemist, public health aide, author, and president of the Hebrew Technical Institute, New York, N.Y., Nov. 22; **P. W. Fattig,** 72, entomologist and curator of the Emory University Museum, Atlanta, Ga., Dec. 7; **Walter K. Fisher,** 75, professor emeritus of zoology and former director of Hopkins Marine Station, Stanford University, Pacific Grove, California, Nov. 2; **Edward M. Frankel,** 60, research chemist and chemical engineer, New York, N.Y., Nov. 19; **M. I. Graves,** 86, internist and former president of the Texas Medical Association, Houston, Tex., Nov. 19; **Harry C. Guess,** 65, faculty member at the University of Buffalo Medical School, Buffalo, N.Y., Dec. 2; **Herbert E. Ives,** 71, electron-optical scientist, developer of 3-D photography, wirephoto transmission, and television, and former vice president of AAAS, Upper Montclair, N.J., Nov. 13; **James H. King,** 61, marine engineer and former president of the Society of Naval Architects and Marine Engineers, Scarsdale, N.Y., Nov. 14; **Stephen W. McClave, Jr.,** 72, engineer, Englewood, N.J., Nov. 24; **Wilfred G. McConnel,** 84, retired civil engineer, Stamford, Conn., Nov. 21; **Charles F. Menninger,** 91, psychiatrist, founder of the Menninger Clinic, Topeka, Kans., Nov. 28; **J. Hillis Miller,** 54, former professor of psychology and president of the University of Florida, Gainesville, Fla., Nov. 14.

Elsie B. Naumburg, 73, ornithologist and staff member at the American Museum of Natural History, New York, N.Y., Nov. 26; **George E. Partridge,** 83, psychologist and former lecturer at Clark University, Worcester, Mass., Nov. 16; **Stefan Pienkovsky,** chief of atomic research in Poland. Warsaw, Nov. 21; **Frank H. Pike,** 79, neurologist, former professor, and lecturer at the College of Physicians and Surgeons, Columbia University, New York, N.Y., Nov. 13; **George Rosengarten,** 66, professor of physics and mathematics at the Philadelphia College of Pharmacy and Science, Philadelphia, Pa., Nov. 23; **Conley H. Sanford,** 60, professor and chief of the Division of Medicine of the University of Tennessee College of Medicine, Memphis, Tenn., Nov. 16; **Reed A. Shank,** 61, surgeon and former faculty member of the University of Cincinnati College of Medicine, Nov. 26; **Timothy W. Stanton,** 93, former professor and retired chief geologist of the United States Geological Survey, Washington, D.C., Dec. 4; **Harold A. Titcomb,** 78, consulting and mining engineer, Farmington, Me., Nov. 26; **Oldrich Tomicek,** 62, professor of analytical chemistry at the University of Prague, Czechoslovakia, Oct. 21; **Philip W. Woods,** 45, dental consultant for the Welfare and Retirement Fund of the United Mine Workers of America, Takoma Park, Md., Dec. 10; **Pope Yeatman,** 92, mining engineer, Philadelphia, Pa., Dec. 5.