at the accelerator, exclusive of construction workers, and the staff is expected to level off at about 800. A large permanent staff will be required to operate and maintain the accelerator itself and to deal with experimentation equipment, which has become both complex and massive (a ratio of about eight technicians and administrative and maintenance workers to one researcher is anticipated). The large magnetic spectrometers, spark chambers, which will be used with the accelerator, are literally factory-sized machines.

SLAC's annual operating budget is expected to be about a $15- to $20-million item for the AEC.

With its big staff and budget, SLAC raised some misgivings on the Stanford campus. While the disquiet is mostly subsurface, there appear to be two main sorts of apprehension: (i) that emphasis on the accelerator will further enhance the position of science at the expense of the humanities and social sciences, and (ii) that the glamor of the accelerator will give high-energy physics research a privileged position among the sciences.

The university administration has taken pains to allay fears that substantial university resources are being diverted into the SLAC project. The recent statement on the power line, for example, said, "The trustees accepted the AEC accelerator on Stanford property upon the clear understanding and agreement that the university would not realize financial gain or loss from the installation or operation of the project."

Administration Guarantees

The Stanford presidency is traditionally a strong one, and the administration is committed to balance academic development. Under President Wallace Sterling, Stanford has recently completed a monumental fund-raising campaign which brought in over $100 million, and a lot of this money is earmarked for building up the humanities and social-sciences programs and for such things as bolstering the business school and expanding the medical school.

Administratively, Stanford has built some dikes against the tide of SLAC influence. SLAC's business operations have been separated from the university's and it will handle its own housekeeping, bookkeeping, personnel, and maintenance details. This should help prevent swamping of the university business operation with SLAC affairs.

What SLAC's effect on the physical sciences in the university, especially on the physics department, will be, remains a question for the future, but here, also, some applicable checks and balances are already a part of the Stanford system.

The existing high-energy physics lab has for some time been accorded separate status, and this is expected to serve as a precedent for SLAC. Key to the system is the rule that control of graduate students, both de jure and de facto, remains in the hands of their academic department, even should they do research on an off-campus facility. Faculty members control the admission of graduate students, approve their line of research, and directly supervise work for theses, and this arrangement is expected to prevent, for example, swarming of graduate students in physics to SLAC like bees to a new hive.

Physics department head Leonard Schiff, who appears untroubled by the possibility that SLAC will exert a strong centripetal force on grad students, says that Stanford has "a physics department, not a high-energy physics department," and cites the growing emphasis at Stanford in recent years on research in low-energy, low-temperature, solid-state, and theoretical physics.

Senior staff at the accelerator will get a kind of separate-but-equal treatment—that is, faculty status stopping technically short of tenure. There are expected to be about 40 senior researchers at SLAC—half of them permanent staff and half visiting researchers—and 40 graduate students and postdoctoral fellows.

Demands for time on the big machine are expected to be very heavy when research operations begin, and the decision, in the first instance, on which experiments to schedule will be up to Panofsky and his associates. Because it may take a scientific Solomon to satisfy the applicants, and because SLAC is a national facility, the director will be backed by a scientific policy committee, made up of eminent men in the field and charged with reviewing and approving SLAC policies and projects.

So even now, years before the first electron is accelerated, SLAC, with its cuts and fills and high-tension power controversy, has brought home to Stanford the problems, internal and external, which arise as Big Science gets bigger.—JOHN WALSH

Elliott Hearings Published

Testimony and statements from the first round of hearings of the House Select Committee on Government Research, chaired by Representative Carl Elliott (D–Ala.), were published last week: Title: *Federal Research and Development Programs,* Part 1, $2.50; Part 2, $1 (U.S. Government Printing Office, Washington, D.C. 20402).

Announcements

Norbert Wiener, emeritus professor of mathematics at the Massachusetts Institute of Technology, died 18 March while traveling in Europe with his wife.

Wiener was born in Columbia, Missouri, in 1894. He graduated from the Ayer, Massachusetts, public high school at the age of 11, received a B.A. from Tufts at 14 and a Ph.D. from Harvard at 19. He joined the M.I.T. faculty in 1919, became a full professor in 1932, and remained there until his retirement in 1960.

Wiener was a child prodigy who fulfilled early promises of brilliance. A talented linguist, philosopher, and literary scholar, he was best known to the public as the "father of automation," and to his professional colleagues as the father of the term *cybernetics.* He was quoted as using the word to define a field that "combines under one heading the study of what in a human context is sometimes loosely described as thinking and in engineering is known as control and communication." Wiener's book *Cybernetics; or, Control and Communication in the Animal and the Machine* was published in 1948, and evoked wide interest among laymen and scientists. Among his other books were *The Fourier Integral and Certain of Its Applications, Harmonic Analysis in Complex Domains,* and *The Human Use of Human Beings.* He also wrote two autobiographical books, *Ex-Prodigy* and *I Am a Mathematician,* and contributed numerous articles to mathematical and scientific journals.

The American Pharmaceutical Association has joined the American Medical Association and the United States Pharmacopeia in their program of selecting **nonproprietary names for drugs.** The AMA and USP had combined efforts for this project in 1961, and the APhA cooperated through its Committee on National Formulary. Names

chosen by this group were called United States Adopted Names (USAN). Under the new program, each organization has equal responsibility for designating the USAN through the activities of a joint committee, the USAN Council. This council includes W. C. Cutting, Stanford University Medical School, chairman; Edward G. Feldman, APhA; Joseph B. Kirsner, University of Chicago Medical School; and Lloyd C. Miller, USP. The AMA will continue to provide the secretariat and administrative facilities for the joint project.

Rutgers University is the site of a recently formed national center to evaluate **pesticides** that are used on a minor scale. The project is a cooperative effort between the agricultural experiment stations of the Land Grant colleges and the U.S. Department of Agriculture. It was established because, although chemical manufacturers conduct a great deal of research to provide assurances of the safety of chemicals used on widely-grown crops, tests for pesticides used on the minor crops are often not as extensive. The center's function will be to "pinpoint research needs that will permit the use of chemicals on these . . . crops to the satisfaction of the FDA." Charles C. Compton, recently retired from the Agricultural Chemicals Division of the Shell Chemical Company, Washington, D.C., is head of the project. He has also been appointed professor of entomology at Rutgers.

Columbia University is offering an interdisciplinary program leading to a doctoral degree in **plasma research**. The program will provide course and laboratory work in the scientific and engineering aspects of plasma research in the departments of physics, electrical and mechanical engineering, and applied mathematics. (R. A. Gross, School of Engineering and Applied Science, Columbia University, New York 27)

An international center for research and information on **Parkinson's disease** is being built at Columbia University, New York. Sponsored by the Parkinson's Disease Foundation, the Public Health Service, and Columbia, the center's primary objectives will be to conduct a comprehensive program to determine the causes of the disease, to improve diagnostic techniques and to develop methods of treatment and management of this and related disorders. The information facility will be a reference center on current therapy for researchers and physicians. Plans call for a comprehensive library service, periodic publication of reviews in the field, and meetings and symposia. The facilities are being headed by H. Houston Merritt, dean of the College of Physicians and Surgeons at Columbia, and by neurology professor Melvin D. Yahr.

A master's degree program in **polymer materials** is being offered at the Polytechnic Institute of Brooklyn. The program permits work exclusively in polymer chemistry and technology, and is conducted jointly by the departments of chemistry and chemical engineering, and the Institute of Polymer Research. Some research fellowships are available. Further information can be obtained through the department of chemical engineering, Polytechnic Institute of Brooklyn, 333 Jay St., Brooklyn, N.Y. 11201.

Grants, Fellowships, and Awards

The American Museum of Natural History has established the Theodore Roosevelt Memorial Fund to provide grants for the study of North American fauna. Grants "in small amounts" will be awarded to persons conducting research in any phase of wildlife conservation, animal ecology, or related fields of **North American natural history** included in the museum's activities. Preference will be given younger scientists, particularly graduate students. Application deadline: *15 April.* (Director, American Museum of Natural History, Central Park West at 79th St., New York, N.Y. 10024)

Boston University offers a research internship program for graduates who are studying toward the M.S. degree in **communication research.** The interns will work in a cooperating research organization for 3 months between their second and final semesters of study, and will receive $80 a week during that time. (E. J. Robinson, Communication Research Division, Boston University, Boston 15, Mass.)

Grants are available for individual fundamental research in **petroleum**, through the American Chemical Society's Petroleum Research Fund. Applicants must have been on the regular teaching staff of a college not more than 3 years, and have no outside research support at the time the PRF grant is accepted. They must have completed all requirements for the Ph.D. degree, although the grant may be awarded before the degree. Recipients of the grants must carry out the research at their institutions. The $1500 grants are primarily for supplies and analyses, and are not renewable. Deadline for receipt of applications: *1 July.* (K. Dittmer, Petroleum Research Fund, ACS, 1155 16th St., NW, Washington, D.C.)

An institute in **"cross-cultural research"** will be conducted by the department of anthropology at the University of Pittsburgh, 20 July to 28 August. The course will include work in both methods and applications, and is open to pre- and postdoctoral students and faculty members. The program is sponsored by the National Science Foundation. Financial aid will be available; predoctoral applicants may receive $800; postdoctoral, $1200. Applications must include a curriculum vitae, two letters of recommendation, and a statement of interest in the course. Deadline: *15 April.* (A. Tuden, Department of Anthropology, University of Pittsburgh, Pittsburgh 13, Pa.)

Fellowships are available at the Wayne State University College of Medicine for an M.S. program in **radiological health.** Applicants should have a background in physics, biology, mathematics, chemistry, and engineering. The program, sponsored by the Division of Radiological Health, U.S. Public Health Service, can be completed in 12 to 15 months, the final quarter to be spent in field training; recipients of the fellowships may enroll for the summer quarter at the university. Stipends are $250 a month, plus $30 monthly dependency allowance. (J. E. Lofstrom, Department of Radiology, Wayne State University College of Medicine, 1401 Rivard St., Detroit 2, Mich.)

Research fellowships in **oceanography** are offered by the Scottish Marine Biological Association, at the Oceanographic Laboratory, Edinburgh. Recipients will work as members of a team using continuous plankton recorders, in the North Atlantic Ocean. Fellowships are for 1 year, but may be renewed for an additional year. Scientists of any nationality may apply. (R. S. Glover, Oceanographic Laboratory, Craighall Rd., Edinburgh 6, Scotland)

Meeting Notes

Prospects for reducing the costs of atomic power by advances in **nuclear fuel** technology will be the subject of a conference of the Atomic Industrial Forum, 14–15 May in Washington, D.C. It will be attended by equipment manufacturers, fuel producers, utility companies, and government representatives. The meeting will feature discussion of the technological and economic achievements significant in meeting increasing demands for electric power service. (AIF, 850 Third Ave., New York 22, N.Y.)

The call for papers has been issued for the international conference on **military electronics** (MIL-E-CON), to be sponsored by the International Institute of Electrical and Electronics Engineers in Washington, D.C., 14–16 September. Papers will be unclassified, and no clearance will be required for participation in the meeting. Abstracts of 500 words are required in triplicate, along with a brief biography of the author. Deadline: *1 May*. (H. M. O'Bryan, Bendix Corp., 1730 K St. NW, Washington, D.C. 20006)

A symposium on the action of **visible and ultraviolet light** on human skin and disease will be presented 4–6 May at the New York University Medical Center. It will cover advances in basic and clinical knowledge as they relate to occupational hazards, carcinogenesis, genetic and metabolic factors, and photosensitive cutaneous reactions. (Office of the Recorder, N.Y.U. Post-Graduate Medical School, 550 First Ave., New York 16)

Courses

The session on **alpine tundra ecology**, 6 to 11 July, will be limited to 25 participants. The topics covered will include alpine environment, alpine plants and animals, their adaptations and ecological relations. A fee of $25 for one week, $35 for two, is required. Deadline: *15 May*. (Executive Secretary, Rocky Mountain Nature Association, P.O. Box 147, Estes Park, Colo.)

A workshop in **pesticide residue analysis** is scheduled 20–23 April, at the Food Research Laboratory of the New York State Agricultural Experiment Station, Geneva, sponsored by Cornell University. An instrument show on gas chromatography apparatus will follow on 24 April. The course will emphasize the use of currently available techniques for the detection and analysis of pesticide residues in plant and animal products. The $50 tuition will cover chemicals, supplies and equipment, a series of luncheons, and a banquet. (D. F. Farkas, Dept. of Food Science and Technology, New York State Agricultural Experiment Station, Cornell University, Geneva, N.Y.

A program leading to a Ph.D. degree in **chemical physics** has been established at Indiana University. Participants may major in physical chemistry with minors in theoretical physics and mathematics, or major in physics with minors in physical chemistry and mathematics. Financial assistance is available through teaching and research assistantships, graduate school and National Defense Education Act fellowships, and NASA traineeships. (H. Shull, Chemistry Department, Indiana University, Bloomington)

Papers are solicited for the 11th national symposium on **reliability and quality control,** scheduled 12–14 January 1965, in Miami Beach, Florida. The meeting will be sponsored by the Institute of Electrical and Electronics Engineers, the American Society for Quality Control, and the Institute for Environmental Sciences. Ten copies are required of the title, an abstract of no more than 800 words, and a short biography of the author. Deadline: *1 May*. (H. E. Reese, Military Systems Division, Burroughs Corp., Box 305, Paoli, Pa.)

The University of Chicago has begun a training program in **computers for biomedical scientists.** Instruction will be provided at various levels, to suit the needs of individuals with differing mathematical backgrounds and professional aims. Participation can be arranged on a full or part-time basis, and financial aid is available through the PHS. The program is directed by H. D. Landahl of the university's Committee on Mathematical Biology.

The call for papers has been issued for the 1964 fall **joint computer conference**, scheduled 27–29 October, in San Francisco, Calif. The topics to be included are analog and hybrid computers, artificial intelligence, business data processing, components and circuits, display, education and computers, information storage and retrieval, input-output devices, logical design, mathematical techniques, multiprocessors, process control, programming, standards for hardware and software, storage and systems. Five copies are needed of the drafts of completed papers, not to exceed 10,000 words, and of the 150-word abstract. Deadline: *1 May*. (D. R. Brown, Stanford Research Institute, Menlo Park, Calif.)

New Publications

A 316-page book entitled **Human Aging: A Biological and Behavioral Study** has been released by the Public Health Service. The report is a study of the processes of aging, conducted at the National Institute of Mental Health by some 22 scientists. The subjects of the study were men, aged 65 to 92, and although they were carefully selected, it was recognized that they are not representative of the total population. Still, the editors feel that it "gives considerable weight to social and psychological factors in aging," partially because the subjects who had no major vascular disease showed better comprehension, memory, attention and readiness to respond, and emotional responsiveness than did those who did have some—although minimal—signs of major disease. (Superintendent of Documents, GPO, Washington 25, D.C., $3)

The Midwest Inter-Library Center (MILC) has issued a list of **serial publications** held by the Center and its member libraries. The list includes some 2500 rare publications in several languages which are abstracted in *Biological Abstracts* and *Chemical Abstracts*. The project was supported by a National Science Foundation grant. MILC reports that many of the publications on the list are believed to be available only through the Center, and plans call for issuing occasional supplements noting new acquisitions. All material may be used by member and nonmember libraries alike. Further information can be obtained from MILC, 5721 Cottage Grove Ave., Chicago 37, Ill. (*Rarely Held Scientific Serials in the Midwest Inter-Library Center*. 197 pages)

A review of the establishment of natural areas as **outdoor laboratories** for research is available from The Nature Conservancy, in Washington. The 32-page booklet comprises the

proceedings of the first national conference on college natural areas, held at the University of Illinois, in June 1962. The publication presents discussions of uses of undisturbed land for teaching and research in field biology, and the establishment, administration, management, and preservation of these areas. (*College Natural Areas as Research and Teaching Facilities*, The Nature Conservancy, 2039 K St., NW, Washington, D.C. 20036 $1)

New Journals

High Temperature, journal of the Soviet Academy of Sciences, translated by the Consultants Bureau, New York; vol. 1, No. 1, July–August; English translation, January 1964. (American Institute of Physics, distributors, 335 East 45th St., New York, N.Y. Bimonthly, $50 per year)

AIAA Bulletin. vol. 1, No. 1, January 1964. Bobbi Chifos, managing editor. (American Institute of Aeronautics and Astronautics, 599 11th St., New York, N.Y. 10036. Monthly, $1 per year for members)

Psychotherapy: Theory, Research and Practice. vol. 1, No. 2, January 1964. E. T. Gendlin, editor. (Psychotherapy, University of Chicago, 5730 Ellis Ave., Chicago 37, Ill. Quarterly, $8 per year)

The Mountain Geologist, quarterly, vol. 1, No. 1, January 1964; John D. Haun, editor. Rocky Mountain Association of Geologists, 1554 California St., Denver, Colo. 80202. $5 per year.

International Journal of Electrical Engineering Education, quarterly, vol. 1, No. 1, June 1963. Michael G. Hartley, editor. Department of Electrical Engineering, Manchester College of Science and Technology, Manchester 1, England. $10 per year.

Films

The following 30-minute color films are available through Norwood Films, 926 New Jersey Ave., NW, Washington, D.C. Purchase price, $250; rental, $15 per week.

The Biochemical Basis of Disease. Background on body chemical processes, and chemical treatment of diseases which interrupt these processes.

The Biochemical Basis of Evolution. Explanation of species changes which provide a basis for studies of animal evolution.

Cosmic Rays. Dangers and possible scientific uses of cosmic rays present in outer space; describes the position of living animals, and gives a view of atmospheric conditions.

Crystals. Explanation of the structure, identification, and use of some forms of crystals.

Free Radicals. Fundamental examination of molecular fragments.

Medifilm Report V (32 minutes, black and white, sound). Highlights of the 112th annual meeting of the American Medical Association. Includes material on new developments in medicine, and medical activities abroad. (AMA, 535 North Dearborn St., Chicago, Ill.)

Heart Research News (15 minutes, black and white, free loan). Nine segments on research supported or conducted by the National Heart Institute, each based on a published paper. PHS (Audiovisual Facility, Communicable Disease Center, Atlanta, Ga.)

Scientists in the News

Herbert F. York, chancellor of the University of California at San Diego and La Jolla, and **Philip Handler**, chairman of the department of biochemistry at Duke University Medical Center, have been appointed to the President's Science Advisory Committee. PSAC serves as a principal advisory committee to the White House on scientific, engineering, and educational matters. Appointments are generally for 4 years.

The other members are:

Donald Hornig, chairman; director of the White House Office of Science and Technology.

Harvey Brooks, dean, division of engineering and applied physics, Harvard.

Melvin Calvin, chemistry professor, University of California, Berkeley.

Paul M. Doty, chemistry professor, Harvard.

Richard L. Garwin, Watson Research Laboratory, Columbia.

Edwin R. Gilliland, chemical engineering professor, M.I.T.

Franklin A. Long, chemistry professor, Cornell.

Colin M. MacLeod, deputy director, U.S. Office of Science and Technology.

William D. McElroy, chairman, department of biology, Johns Hopkins.

Wolfgang K. H. Panofsky, director, Linear Accelerator Center, Stanford.

John R. Pierce, executive director for research, Bell Telephone Laboratories, communications principles and communications systems division.

Edward M. Purcell, physics professor, Harvard.

Frederick Seitz, president, National Academy of Sciences.

Jerome B. Wiesner, dean of science, M.I.T.

Jerrold R. Zacharias, professor of physics, M.I.T.

The first Keilin memorial lecture will be presented 17 September during a meeting in Cambridge, of the Biochemical Society of Great Britain, by **André Lwoff**, head of the department of microbial physiology of the Pasteur Institute, Paris. He is currently a Royal Society visiting professor at the National Institute for Medical Research in London. The Keilin Memorial Fund Committee recently reported the success of its appeal for funds to endow the lectureship.

The New York Botanical Garden has appointed **Robert Breach**, former president of Gordon and Breach Science Publishers, Inc., to the newly established position of curator of publications.

Cass Canfield, chairman of the executive committee and editorial board of Harper and Row, was announced as recipient of the 1964 Albert Lasker award of Planned Parenthood–World Population. The $2500 prize went to him for leadership in increasing the "worldwide recognition of the economic and political importance of population control."

The Royal Canadian Geographical Society recently awarded its Massey medal to **Yves O. Fortier**, chief of the economic geology division, Geological Society of Canada. The medal is awarded for contributions to Canadian geography and geology.

Erratum: In the meeting report "Brain reflexes" [*Science* **143**, 598 (7 Feb. 1964)], line 10, paragraph 2, page 604, Bureš (C.S.S.R.) should be included as one of the speakers on the Soviet Union television program.

Erratum: In the report on Section U—Statistics [*Science* **143**, 855 (21 Feb. 1964)], paragraph 2, the speaker at the session for teachers of statistics was Dr. Fred C. Leone, Case Institute of Technology, and not Horace W. Norton. Dr. Norton chaired the session.

Erratum: The name of the author of the report on the Division of Chemical Literature, American Chemical Society [*Science* **143**, 1236 (13 Mar. 1964)] was incorrectly given as B H. Heil. It should be B. H. Weil.