plans to select a site this year, so that final design funds may be included in the fiscal 1967 budget.

Finally, the Academy last week released a summary of the final report on a study conducted last summer on "Biology and the Exploration of Mars." The study, conducted by a working group of the Academy's Space Science Board, concluded that, "given all the evidence presently available, we believe it entirely reasonable that Mars is inhabited with living organisms and that life independently originated there." It recommended a "large orbiting mission" to study Mars by 1971, and the first instrument landing mission no later than 1973, and by 1971 if possible. The summary of the report put particular emphasis on the development of sterilization techniques to avoid contamination of the Martian surface, and stated, "We believe that many of our non-biologist colleagues have still not fully grasped either the magnitude or the fundamental importance of this issue." The study group was chaired by Colin Pittendrigh, of Princeton, and co-chaired by Joshua Lederberg, of Stanford.—D.S.G.

## State Department: Rank, Authority of Science Office Is Emphasized

The State Department last week took steps to increase the attractiveness of its top science position, a job that has been vacant since last fall.

Henceforth, it was announced, the director of the science office will have "rank and authority" equivalent to that of an Assistant Secretary of State. He won't actually have that title, however, since the number of assistant secretaries is limited by Congress to 12, and the Department apparently doesn't want to go through the process of seeking an increase. At present, some seven or eight State officials hold the rank without the title, which is third highest in the Department hierarchy. Previously, it was supposed to be understood that the science director was equivalent to an assistant secretary, but this never was explicitly stated, an omission that is said to have caused some problems in the carefully ranked Department. The Department also announced that the name of the office is changed from International Scientific Affairs to International Scientific and Technological Affairs. The last director, Ragnar Rollefson, a physicist, returned to the University of Wisconsin in September after serving for 2 years. The position pays $26,000 a year.

The office operates a science attaché program at many diplomatic posts and serves as the Department's adviser on scientific and technical matters affecting foreign policy. The acting director of the office is Herman Pollack, a career officer with long experience in administration, but no scientific training.
—D.S.G.

## Summer: The "Climate" Is Changed for University Scientists and the Federal Government Did It

In the spring the scientist's fancy, like anybody else's, turns to thoughts of what he'll be doing when summer comes. And it's a safe generalization that most scientists will spend their summers rather differently from the way they would have a generation ago.

In the old days (prewar), when the long vacation began the geologists headed for the hills, the oceanographers went to sea, the marine biologists went collecting at the seashore, and the anthropologists set out looking for primitives. And they still do. But for most academic scientists, the end of the school year in the depressed 1930's meant teaching summer school for money or doing research in a semi-deserted lab and probably washing one's own glassware.

The big change in summer occupations for scientists, like most recent big changes in science, is traceable to the arrival on the scene of the federal government and federal funds.

The competent scientist now has a veritable smorgasbord of summer activities to choose from—travel, domestic or foreign, to do research or to teach or to attend a rich variety of meetings, conferences, seminars, or symposiums.

The traveling professor is a familiar figure year-round as he flies off to fill consulting commitments to industry or government or makes the academic rounds. But it is in the summer that scientists, like businessmen, are likeliest to combine pleasure with business by taking wives and children along and sometimes making extended side trips.

How wide the horizons can be is indicated by a recent notice to Americans that a group was being made up to fly from Amsterdam to a physiological sciences congress in Tokyo, with a 3-day stopover in Moscow and a 3-day side trip to Tashkent, Bokhara, and Samarkand.

Most opportunities are not quite so exotic, but scientific societies now generally take into account the extracurricular interests of their members in planning for meetings. The American Society for Microbiology, for example, in exploring the most desirable and least expensive way for its members to attend the 9th International Congress for Microbiology, to be held in Moscow in July 1966, is asking for applicants for a variety of charter flight arrangements. There are several options: a direct flight to Moscow with an immediate return after the conference; a return flight from Paris 2 weeks after the conference closes; and a 2-week conducted tour with a choice of northern, central, or southern European itineraries.

While he pays for the excursions himself, there is no question that, depending on his standing and his endurance, the American scientist has opportunities for travel not open to people in most other occupations. In general, it is the most distinguished who are the best traveled.

Travel within the United States has also increased considerably, and a number of summer-only institutions have developed. Two influential models for these, both established before the war, are the Marine Biological Laboratory at Woods Hole and the Gordon Research Conferences.

The conferences, named for Professor Neil Gordon, were started in 1931 at Johns Hopkins, where Gordon taught, and were later moved to Gibson Island in Chesapeake Bay. After World War II, for a number of reasons—notably the heat and humidity and the increasing intrusion of vacationers—the conferences were moved to the cooler and more austere latitudes of the New England academies.

The combination of plain living and fancy thinking has proved a durable attraction, and the pattern of 5 days of morning and evening sessions with the afternoons left free has been maintained. Attendance is limited to about 100, and the rule that nothing said at the conference shall be for attribution permits researchers working within a specialty to engage in a kind of give-and-take possible almost nowhere else.

The Gordon blend of informality and intensive exploration of a subject has proved so popular that a winter version

of the conferences has been held on the West Coast and a series of European conferences have been based on the Gordon model. A series of engineering conferences, now held at Proctor Academy in Andover, Massachusetts, in the summer, are Gordon conferences in almost all but name, and many other conferences draw on the formula.

### Summer Only

The Marine Biological Laboratory at Woods Hole on Cape Cod is certainly one of the most venerable of summer-only scientific institutions. Established in 1888, the M.B.L. has gone its independent way, maintaining much of its original character, by continuing to give courses such as its famous Invertebrate Course, and simply by providing services to researchers and their graduate students. For more than 75 years it has, as one M.B.L. veteran puts it, "given biologists a chance to get their feet wet." But in recent years it has welcomed other physical scientists who could advance their research by using M.B.L. facilities.

The M.B.L. still gives courses to bright youngsters, and there are programs for graduate students and researchers at the postdoctoral level. The anchor men at Woods Hole, however, are the more than 200 independent investigators, each there on his own grant, which in most cases is a federal grant.

The laboratory has a good science library and, largely by virtue of apparatus grants from the National Science Foundation, the National Institutes of Health, and the Atomic Energy Commission, has acquired its quota of highly sophisticated instruments and now even boasts a hot lab. As its physical resources and prestige have increased, the question of the June-to-September term of the M.B.L. has become a point of issue. A research group, with Albert Szent-Györgyi as perhaps its best-known member, already works year-round at the M.B.L., and pressures to broaden the laboratory's full-year operations are sure to continue.

Woods Hole has an aura. Despite its being crammed into a crowded corner of the Cape and awash with summer people getting on and off boats for Nantucket and Martha's Vineyard, and in spite of high housing costs, people are drawn back to Woods Hole year after year. Turnover, at M.B.L., exclusive of people in the courses, is estimated at something like 30 to 40 percent over 5 years. And Woods Hole attracts others as well, who agree that it makes a nice place for a conference.

A case in point is a meeting scheduled for this summer designed to bring together government, industry, and university leaders who can contribute to the planning of a 5-year research program aimed at helping libraries deal more effectively with information-transfer problems.

A $200,000 grant from the Independence Foundation of Philadelphia, formerly the Donner Foundation, will finance this first step in an effort called project INTREX (information transfer complex) to determine how science and engineering can be drawn on for techniques to improve library services and functions.

About 40 individuals, including library authorities, will meet at the pleasant National Academy of Sciences Center at Woods Hole to formulate plans for INTREX.

Summer programs financed by federal agencies in support of their missions are another phenomenon which has developed largely since the war. The Defense Department and the National Aeronautics and Space Administration have been notable patrons of this sort of activity.

A random example is a summer faculty program in space physics to be held from 6 July to 27 August at Columbia University. Twelve fellowships carrying stipends of $200 a week for 8 weeks are available, through a national competition, to applicants who have completed Ph.D. requirements in physics, astronomy, or the earth sciences.

Other forms of summer activity peculiar to the postwar years have been generated by the support of curriculum reform groups by NSF and private foundations.

The summer market for scientists' talents is a competitive one, and in recent years it has been necessary to provide reasonably good remuneration to get good men. One study group devoted to revision of science curriculum at the college level last year offered an honorarium of $400 for a 10-day session, plus travel expenses, a per diem payment at the standard federal rate of $16 a day, and the added inducement of access to the Rockies.

The rise of federally sponsored "summer institutes" since the war, in large part a consequence of changes in science and math and foreign languages curricula, has opened new summer vistas for college faculty and especially for teachers in the high schools. NSF science and math institutes average about 7 weeks in length, and a stipend of $75 a week plus an allowance for dependents is paid each teacher attending. The stipend is designed, not to pay people for going to school, but to compensate for loss of income, which in the case of many high school teachers might be earned painting houses or working at the supermarket checkout counter.

NSF spends an estimated $5.2 million on institutes for college teachers, $23.4 million for high school teachers, and $1.25 million for elementary school teachers. This summer about 4000 college faculty members and 34,400 high school teachers are expected to attend institutes in science and math. Institute faculty are paid at rates that are normal in the institution administering the program.

The great influence on the scientist's summer, however, is the research grant. In every season the key to well-being for the university researcher, be he great or small, has become his research grant, which is important to his income, to the subsistence of his graduate students, and to the budget of his department.

### Traveling

For many a researcher on an academic-year salary, the research grant provides an additional one-fifth of his regular salary which makes research in the summer possible and the living easier.

The grant, combined with university funds, is also a main source of the scientist's summer mobility. The grant-awarding agencies generally countenance use of some grant funds for travel—whether for a visit to another laboratory or for attendance at a conference here or abroad—so long as it is relevant to the project supported by the grant.

No fixed sum or percentage for travel is set, but NSF officials estimate, for example, that about $300 a year per grant is close to the average spent on travel.

NSF also has an international travel grants program with about $450,000 available, exclusive of money used to finance the U.S.–U.S.S.R. exchange program. These funds must quite literally be used for travel alone, and not

for paying other costs of attendance at meetings or visits to foreign laboratories. NSF officials describe the competition for these grants as stiff. Different divisions of NSF handle the award of grants differently. Where many applicants are involved, scientists outside the agency may be asked to rate them. Where only a few are involved, the matter will be handled within the agency. Final decisions in both cases are made by NSF administrators, and the program directors in this are key men, as they are in so many other ways in the operation of NSF.

The matter of travel in general, whether financed out of an individual's research grant or by a special travel grant, is a special bureaucratic affliction, since agency approval is required for all travel and the administrator may feel that he is spending as much time on a request for authorization to travel as he is on an application for a research grant involving many times as much money.

Science-agency officials are aware that travel funds are a potential sore point with Congress, which is much more keenly watchful of spending on travel by the executive than by its own members. Agency officials therefore are expected to screen carefully and enforce the rules that decree economy jet fare only, and use of American-flag carriers wherever possible.

There are some indications that, for a number of reasons, including the gold drain and doubts within the agencies about the value of some meetings abroad, a tightening policy on international travel may become evident this summer.

Travel, foreign and domestic, is generally accepted as a legitimate part of the scientific life. It is a part where a kind of honor system prevails, for beyond a certain point there is really no way of telling who travels because of the meeting and who goes to the meeting because of the travel.

—JOHN WALSH

## Announcements

The National Science Foundation has reorganized its activities in support of **science education**, and has established three divisions to carry out its programs in the field. Each division will be responsible for improving curricula and course content at its own level, and for providing more study and research opportunities for both faculty and students. In addition to the divisions, a planning and evaluation unit will carry out program development and analysis for Foundation activities in support of science education, and an operations unit will carry out the processing and record-keeping functions for the divisions. The three divisions and their heads are: Pre-College Education in Science, led by Keith Kelson, formerly deputy director of the division of scientific personnel and education, which has been abolished; Undergraduate Education in Science, headed by Leland Shanor, formerly head of the undergraduate education in the sciences section; and Graduate Education in Science, headed by Thomas D. Fontaine, who was in charge of the fellowships section.

The **Atomic Energy Commission** plans to discontinue formal courses at Oak Ridge School of Reactor Technology (ORSORT) and at the Argonne Institute of Nuclear Science and Engineering (AINSE) in June. The reasons given for the move include increasing capability of U.S. and foreign schools to provide advanced degree programs in the field; establishment of schools similar to ORSORT in several foreign countries; and increasing difficulties of foreign students in obtaining financial support for training at ORSORT. Some 2000 scientists and engineers from 50 countries have received training at the two schools during their 15 years of operation. Educational programs for U.S. colleges working closely with the two nuclear-research laboratories will continue, however, and foreign students who are eligible may still apply for admittance to these.

### Meeting Notes

The call for papers has been issued for the 1965 fall **joint computer conference**, sponsored by the American Federation of Information Processing Societies. The meeting will be held 30 November to 2 December in Las Vegas. There are no special restrictions on subjects for papers. State-of-the-art surveys and original research and development reports on hard- and software are invited; papers on design, selection, installation, and management of information-processing systems are welcome. Complete drafts of the papers and 150-word abstracts are required. Deadline: *15 June*. (R. Gray, P.O. Box 49, Santa Monica, California 90406)

A symposium on relaxation techniques in **chemical kinetics** in solution will be held 28–30 June at the State University of New York, Buffalo. The sponsors are the school's chemistry department and the U.S. Air Force Office of Scientific Research. In addition to the general lectures, sessions are scheduled on biochemical, complex ion, and inorganic systems. The registration fee is $35 for persons who desire on-campus accommodations, $18 for others. (Mrs. E. E. Schmidt, 193 Hayes Hall, State University of New York at Buffalo, Buffalo 14214)

A conference on **neurological mutations in the mouse** will be held at the Jackson Laboratory, Bar Harbor, Maine, 29 June to 1 July. The program will review the research potentialities of the mutants now available. The subjects to be presented include recognition and propagation of neurological mutants, metabolic and behavioral screening methods, demonstrations of normal anatomy and embryology of the mouse brain, and malformations of brain stem, cerebellum, cerebrum, and retina. Sessions will be held also on comparison of disease processes in mouse and man, especially regarding biochemical lesions. (J. L. Fuller, Jackson Laboratory, Bar Harbor, Maine 04609)

Scientists and engineers engaged in theoretical or experimental research in engineering science, physics, chemistry, mathematics, or engineering are invited to contribute original papers for the third technical meeting of the Society of **Engineering Science**. The meeting will be held 3–5 November at the University of California, Davis. Preference will be given to interdisciplinary studies, but work in highly specialized fields will also be considered. Three copies of each manuscript are required. Deadline: *1 July*. (A. C. Eringen, School of Aeronautics, Astronautics, and Engineering Sciences, Purdue University, Lafayette, Indiana 47907)

Papers are being solicited for presentation during the 12th national **vacuum** symposium, 29 September to 1 October in New York. Contributions should report results of original, unpublished work, either theoretical or experimental, in any area relating to production, measurement, or applications of vacuum. Special interest at this year's meeting will be given to "space-