

Administration: "We are no further behind them than we were yesterday. But that's far enough." Glennan cited the propulsion problem as the main source of this country's difficulties, suggesting that "in the opinion of our scientists, we lack only the propulsion capacity to match their spectacular feats."

Work on this problem is currently under way among the U.S. agencies concerned with space. Two rockets, the Vega and the Centaur, are now under development and are expected to match the thrust of the rockets currently in use in the Soviet Union. They are expected to be ready in about a year. Two other rockets, the Nova and the Saturn, are being developed for use in the 1960's. These are being designed to have the 1.5-million-pound thrust that is held to be necessary for extra-terrestrial contacts. In recent weeks, however, there has been discussion about curtailing the Saturn program for lack of funds.

Economy Delays Program

Although no responsible official has stated that more spending alone is the answer to this country's difficulties in the space competition, there is no question that uncertain financing and periodic budget cuts have delayed the programs that promise to provide boosters of the capacity needed. The possibility of curtailment or cancellation of the Saturn program is only one example. During its last session, Congress made a significant reduction of the funds that the President had requested for the National Aeronautics and Space Administration. The House of Representatives had made a cut of \$60 million in NASA's budget. The Senate recommended the full amount of \$350 million. In accordance with the usual practice in Congress, the difference was split, and the space agency lost \$30 million. At the time of the House cut, the NASA administrator said that action would have "crippling" and "disastrous" consequences with regard to space competition. During the period when Congress was acting on the NASA request, there was a lull in Soviet space activities and the cut was the subject of little debate and little publicity. Recent events, including the launching of Lunik II, which hit the moon, and of Lunik III, can be expected to make the issue of economy in space activities a lively one in the political campaigns ahead.

Call for Space Forum Planned by Soviets

The Soviet Union plans to ask the United Nations to convene an international scientific conference on space research. The call for the conference was made last week by Deputy Foreign Minister Vasily V. Kuznetsov in a speech before the U.N. General Assembly. Reports indicate that the Soviet Union will propose that the meeting be held next year and that it be modeled on the scientific conferences on the peaceful uses of atomic energy that were held in Geneva in 1955 and 1958.

The suggestion for the conference was made during a long speech on disarmament that included a discussion of the problems of outer space. Kuznetsov cited recent advances, including the Russian moon shot, and mentioned the need for cooperation in space activities. Following this, he said: "Taking into account the benefits of the exchange of experience in the field of scientific research accomplishments for a more rapid progress in exploring outer space, the Soviet Government intends, in particular, to put forward the proposal to convene under United Nations auspices an international conference of scientists on the exchange of experience in exploring outer space."

Response Favorable

The response to the proposal was generally favorable among the delegates. The United States and Britain approved the suggestion, thus virtually assuring that such a conference would be held. "We welcome this new departure in Soviet policy and hope that it means cooperation in the future work of the United Nations in the field of outer space," Ambassador Lodge said in a statement issued later. In London, the British Foreign Office said that it had no details on the proposal, but that "... we very much welcome the Soviet intentions. Our policy is to encourage the fullest possible international exchange on these matters." Similar responses were made by the leaders of other delegations at the U.N.

Some doubt has been expressed that such a meeting could be held before the last quarter of next year because of the lengthy preparations that would be required. If the model of the "atoms-for-peace" conferences were followed, elaborate displays of devices and techniques would be in order, as well as the

submission of technical papers dealing with all aspects of outer space exploration. Policies on security and declassification would also have to be devised.

Another Meeting Planned

In addition to the projected conference, another space forum is scheduled for next year. This is the meeting of the Committee on Space Research of the International Council of Scientific Unions. The committee is an outgrowth of the International Geophysical Year and seeks to find ways to continue the cooperation in space research that characterized the IGY. The meeting is set for next January and will be held in France. The committee, as a unit of ICSU, is non-governmental in nature, and concerns itself with purely scientific matters, such as advanced notice of space probes, tracking, exchange of data, and the provision of room on space vehicles for experiments prepared by scientists in countries that have no space capabilities. One of the early efforts of the committee was to get international cooperation on the matter of avoiding contamination of the moon.

Although the Soviet Union has voiced objections on the imbalance of the committee representation between Communist and neutralist nations and Western-bloc nations, it is reported that these difficulties are being worked out. The result may be two major exchanges of space data in the coming year, with the Soviet participating in both.

Canadian Atomic Energy Moves Ahead

Canada and Euratom, the six-member European atomic energy pool, have entered into two agreements for a \$10-million peaceful atomic energy exchange program. The first agreement, valid for 10 years, lays down the legal conditions for exchange of source material and special nuclear material on commercial terms, and for exchange of information, technical advice, and training facilities. Under the second agreement, Atomic Energy of Canada Limited will make available its experience with a natural-uranium fueled heavy-water-moderated type of reactor.

The \$10 million is to be contributed over 5 years, half by Atomic Energy of Canada, to be spent in Canada, and the other half by Euratom, to be spent in its member countries — France, West

Germany, Italy, the Netherlands, Luxembourg, and Belgium.

Manitoba Research Center Planned

In another announcement, Atomic Energy of Canada reports that it will build a new nuclear energy research and development center in Manitoba. At present Canada's only major nuclear research center is the Chalk River establishment on the Ottawa River, about 150 miles west-northwest of Ottawa. However, the government-owned company has a Nuclear Power Plant Division in Toronto and a Commercial Products Division in Ottawa.

The management of Atomic Energy of Canada Limited feels that the Chalk River center cannot operate at maximum efficiency if it continues to expand. Among the major facilities at Chalk River are four research reactors, including the NRX and NRU reactors, particle accelerators, and chemical and metallurgical plants. The number of workers is approaching 2500, of whom some 400 are university graduates.

Chalk River Reactor School

A further development in Canadian atomic energy is the announcement that the first class in the newly established Chalk River Reactor School will begin 1 February 1960. Canadian and foreign engineers and scientists may apply for admission to the school, which will have a class of 20 students in each 12-week course.

The school was set up in response to the wide interest shown in the atomic power systems being developed in Canada. The course of studies places special emphasis on power reactors moderated with heavy water and fueled with natural uranium, such as the 20,000 kilowatt NPD (Nuclear Power Demonstration) station now under construction near Rolphton, Ontario, and the 200,000 kilowatt CANDU (Canadian Deuterium Uranium) station to be built north of Kincardine, Ontario.

The Chalk River Reactor School will not duplicate instruction being given by universities. Candidates for the school must have a university degree in physics, engineering physics, chemistry, metallurgy, or engineering. The school will give these graduates first-hand knowledge not only of power reactors but also of the advanced research and engineering test reactors.

Director of the Reactor School is D. A. Keys, scientific adviser to the

president of Atomic Energy of Canada Limited, and secretary is W. R. Livingston, head of the Office of Industrial Assistance. Lecturers are senior company executives and members of the staffs of the various AECL divisions in Toronto, Ottawa, and Chalk River.

Application forms may be obtained from Canadian embassies or consulates or from the Secretary, Chalk River Reactor School, Atomic Energy of Canada Limited, Chalk River, Ontario. Completed application forms for the first course must be received at the secretary's office not later than *15 November*.

U.S. and U.S.S.R. Exchange

Scientific Fishery Knowledge

Five American fishery scientists have returned home after an extensive inspection in August of Russian salmon fisheries, and five Russian fish experts have arrived in the United States to observe American salmon activities, the Department of the Interior reports. The trips were arranged for an exchange of scientific and practical fishery information.

The Russians are touring the Pacific Northwest and Alaska and will return to Washington about 21 October. Their itinerary includes inspection of salmon hatchery operations and the work of fish nutrition and fish disease laboratories. They will see the operations of privately owned can companies, canneries, and fish freezing and cold storage facilities.

The American mission to the Russian salmon areas had a double purpose—to give U.S. specialists an opportunity to learn of Russian fishery operations first hand, and to secure fish and fish blood samples of known Russian origin for a long-range international salmon study which has been in progress for about 3 years. Members of the American group report success in both aims, stressing that their hosts were especially cooperative.

The North Pacific salmon study is a three-nation project—Japan, Canada, and the United States are participating. One purpose of this study is to secure data upon which nations of Asia and North America may base salmon management plans. A specific problem is to determine the place and the extent of intermingling of the American and Asian races of salmon during the time the salmon are at sea. This in turn ne-

cessitates the development of a system of differentiating American from Asian fish. Research has indicated that probably the most reliable way to differentiate between the two races is by blood type.

At the Bureau of Commercial Fisheries Biological Laboratory at Seattle, Washington, considerable work has been done on this project on salmon and blood samples from Japan, Canada, and the United States salmon areas. No salmon unquestionably of Russian origin were available for study until this exchange visit, when the Russians, although their salmon fishing season in most areas was closed, let the American visitors take fish out of streams on the Kamchatka peninsula.

Research Grants

To Be Used by Defense Department

The use of grants for the support of basic research is now permitted in the Department of Defense. The department, acting after a long delay, last month issued a directive implementing a law passed last September which gave the department and a number of other federal agencies authority to use grants as well as contracts. Prior to passage of the law the research contract had been the only means of support for basic research that could be used by the department. Grants, unlike contracts, demand neither detailed plans nor detailed accounting.

The effect of the law, P.L. 85-934, was to liberalize the terms by which some federal agencies, previously limited to contracts, could provide grants for research. Several agencies—the National Science Foundation and the Department of Health, Education and Welfare, for example—already had such authorization and hence were not affected by the act. The principal agencies affected were the Department of Defense, the Atomic Energy Commission, the National Bureau of Standards, and the newly created National Aeronautics and Space Administration.

The Bureau of Standards and NASA have been making use of grants for some time as have some divisions of AEC. The new Department of Defense directive, which became effective 25 August, represents the initiation of the practice by the governmental agency which spends the greatest amount of money on scientific research.