top-level scientists whose first work would be to make "realistic suggestions for meeting the technical problems of disarmament, and meeting them in a professional way on a solid basis." Later, at a reception, Pollard suggested that the agency should be launched with a $50-million budget. Another committee member compared the operation of the proposed organization to that of the Operations Research Organization, pointing out that we should wage peace with the same scientific efficiency that we wage war.

At both the press conference and the reception, committee members noted the lack of scientists on the Republican task force, none of whom are listed in *American Men of Science*. All 17 men in the Democratic group are recognized representatives of the scientific community.

In addition to Pollard, Kusch, and Urey, the members are: Samuel K. Allison, professor of physics, Enrico Fermi Institute for Nuclear Studies, University of Chicago; Harrison S. Brown, professor of geochemistry, California Institute of Technology; Leslie C. Dunn, professor of zoology, Columbia University; Louis B. Flexner, chairman, department of anatomy, University of Pennsylvania; Trevor Gardner, chairman and president, Hycon Manufacturing Company, Pasadena, Calif.; H. Bentley Glass, professor of biology, Johns Hopkins University; David R. Goddard, director, division of biology, University of Pennsylvania; Frank Goddard, Jet Propulsion Laboratory, California Institute of Technology; David L. Hill, consulting physicist, New York, N.Y.; Charles C. Lauritsen, professor of physics, California Institute of Technology; F. T. McClure, chairman, Research Center, Applied Physics Laboratory, Johns Hopkins University; Richard B. Roberts, department of terrestrial magnetism, Carnegie Institution, Washington, D.C.; John S. Toll, chairman, department of physics, University of Maryland; and Gilbert F. White, chairman, department of geography, University of Chicago.

Eight members of the Democratic Advisory Committee on Science and Technology belong to the Federation of American Scientists, an organization that pioneered in the scientist's struggle to be heard in politics. The federation was formed in 1946 by a group of nuclear physicists who felt that Congress should hear the scientists' point of view when it was considering atomic energy legislation. Now that both political parties are giving formal attention to scientific questions, and with legislation pending before Congress, it seems clear that scientific issues will be widely discussed in the 1960 election campaign.

Lunik III Flight to Moon Underscores U.S.-Soviet Positions in Space Competition

Lunik III, the 618-pound Soviet moon rocket, is expected to go around the earth 18 October as it follows the elliptical orbit that first took it around the moon last week. The rocket was launched 4 October, the second anniversary of the launching of the world's first satellite, Sputnik I. Reaction here to the launching and to the developments in the space competition during the last 2 years has been a composite of realistic acceptance of the facts and a growing realization that without the *sine qua non* of space research—rocket boosters in the 1.5-million-pound thrust range—the future can only promise a widening gap between this country's achievements and those of the Soviet Union.

"I wish it were different, but there is nothing you can do to change the clock back." This comment, by Herbert York, the Defense Department's director of research and engineering, reflects both the general view on the latest Soviet moon shot and one of the major reasons for the gap. The Soviet Union is reported to have started its rocket program in 1946, with the aid of a sizable number of German scientists. This country, putting its reliance on bomber-carried atomic weapons, did not start such a program until 1953, when tests in the Pacific showed the feasibility of combining small nuclear warheads with rocket carriers. A crash program was instituted, also with the help of German scientists.

The program, which has been marked by many successes and a number of spectacular failures, has resulted in the orbiting of 12 satellites, including the paddle-wheel satellite that relayed a picture of the earth's cloud cover, and Vanguard III, a 50-pound device launched 18 September. The U.S. satellites have ranged in size from 3 to 450 pounds. Most (and this is regarded as the significant fact) have carried a wide range of finely sensitive—"sophisticated"—instruments that have relayed back miles of taped information on the nature of outer space. The Van Allen radiation belts, for example, were discovered by analysis of this information.

The Russian program has resulted in the orbiting of four satellites, but each, because of its weight and the nature of the experiment involved, represented a major step in the exploration of space. Sputnik II carried the dog Laika. Sputnik III, with a payload of almost 3000 pounds, is the largest satellite ever put in orbit. Lunik III is the first to have circled the moon.

Lunik's Observations Unreported

Although Lunik III was launched almost 2 weeks ago, no concrete information as to its purposes or observations has been reported to the public. At the time of launching it was widely reported that the instrument case contained a camera that would take photographs of the dark portion of the moon. Since 4 October, however, Soviet commentators have not confirmed or denied the earlier report. Nor is factual information available as to whether the satellite passed in front of the moon's path or behind it. Most of the released information on Lunik's progress has been obtained second-hand from the Soviet press agency, Tass. According to these reports, the satellite came within 4375 miles of the moon during its swing around it. A maximum distance from the earth of 291,870 miles was reported. The speed of the satellite varied with the influence of gravity; on the return flight the speed is said to be about 1200 miles an hour. When the satellite reaches the point in its orbit closest to the earth—about 25,000 miles away—it is expected to have a speed of 9000 miles per hour. After it reaches this point Lunik will start on its second outward trip. No prediction has been made about the satellite's life expectancy. Beyond these facts, the United States experts have little information about Lunik. All speculation may be thrown off by the firing of undisclosed "retro" or counter-thrust rockets. Commentators generally agree that the Soviets are making a minimum number of commitments on Lunik to avoid the propaganda risks of missing announced goals.

Among the many comments that followed the Soviet moon shot was one by T. Keith Glennan, administrator of the National Aeronautics and Space

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 extraterrestrial 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