had registered the orbital flights of Gagarin and Titov), the U.S., when it did submit the data on the Glenn flight, gave far more details than it does in submitting the regular registration data. Nevertheless, the U.S. stands on its original position, leaving NASA officials appalled by what they regard to be a tortured and not very useful interpretation of one of the first successful steps toward cooperative space efforts with the Russians. Whatever functions may be attributed to the space register, they feel, its most important is that of helping to establish a pattern of cooperation and agreement, not a new stage for quibbling.

The Air Force quite properly has had nothing to say publicly on the subject of space cooperation. Its motivations in selecting the register as a point of issue remain obscure and even constitute a source of puzzlement for some officials of the high-level arbiter of the space effort, the National Aeronautics and Space Council. One official of the Council offered the opinion in an interview that the registration decision "makes little sense," and "probably reflects nothing more than the military idea that given a choice between being secret and open, you choose to be secret."

Data Withheld

The first draft of the U.S. space data, he said, included data on the Glenn flight, but "then there was concern in Defense about setting a pattern. By holding out this information, even though it was available otherwise, Defense felt that the way would be left open for the United States to withhold data in the future if it felt it was necessary. Again," he concluded, "it doesn't make much sense."

This explanation is an extremely uncharitable one, and it should be kept in mind that however bizarre the position may appear on the surface, it held up when it was reviewed in top levels of the Administration. The final inning, however, may not yet have taken place. NASA officials say they plan to seek a review at the Space Council, which, coincidentally, now has under review a similar conflict involving NASA and the Defense Department. This involves the long-delayed geodetic satellite survey program, at one time a joint NASA-Defense project for employing a satellite with a predetermined flashing light for making far more precise earth surface measurements than are now possible.

These measurements are of considerable interest to the military, which finds missile aiming complicated by the inaccuracies of conventional mapping methods. In 1960, the Defense Department's appreciation of the geodetic satellite's military implications led it to place a secret security classification on the project, an act which caused NASA to withdraw from the project. (NASA from the start has been acutely gun-shy of being associated with military endeavors, but especially so after the "cover story" for the U-2 incident depicted the aircraft as an errant NASA weather plane; one outcome of this was that many neutral nations suddenly turned cool toward cooperating with NASA in tracking operations and other space activities, and NASA has strived ever since to protect its peaceful image.)

Review Ordered

The Defense Department's insistence on maintaining a security classification on the geodetic satellite was placed before the Space Council by Kennedy last month after a number of scientists expressed their concern before the House Science and Astronautics Committee. Among them were George B. Kistiakowsky, presidential science adviser under Eisenhower, who argued that the power of nuclear weapons made precision in aiming relatively unimportant.

"Considering the radius of damage from thermonuclear weapons, it is perfectly obvious that the accuracy for targets is already adequate," he said. "Being able to provide an accuracy of something like 25 to 50 feet is quite unimportant, redundant and unnecessary from the point of view of military target locations, but has a tremendous importance in the study of the earth as a completely unclassified world-wide effort."

NASA's concern about maintaining its peaceful image is heightened by growing evidence that Soviet scientists are beginning to succeed in prevailing upon their political chiefs for closer contacts with the West. It can be argued that the shift toward cooperation reflects nothing but a new Soviet appraisal of selfish national interest. But whatever the motivations may be, the cooperative space efforts that Kennedy has urged since his first day in office are predicated on the assumption that it is in the U.S. national interest to involve the Russians in joint scientific efforts, in space and elsewhere.

The most conspicuous indication of the Soviets' shift has been in their willingness, perhaps eagerness, to rejoin the U.N. Space Committee after a 2-year boycott. One outgrowth of that decision is the participation of their weather experts in the current World Meteorological Organization meetings in Geneva, where, among other things, satellite weather forecasting is under discussion. The subject, incidentally, is one that the Russians were invited to discuss in Washington last November at an international meeting sponsored by NASA and the U.S. Weather Bureau. The Soviets' unexplained absence from that meeting, after having accepted an invitation, was recently alluded to by a Soviet representative, who remarked that the shift in policy was in the works at the time, and if the meeting had taken place a few weeks later, the Soviet delegation could have attended.

Another indication of the shift is in a sudden spurt in communications from Soviet scientists to their Western counterparts. One American who some time ago requested a Soviet colleague to supply some data reports that after a lengthy and unexplainable delay, the data recently arrived. One swallow does not make spring, but this particular incident is interpreted by some Administration officials as representative of a new and hopeful attitude on the part of the Soviets toward scientific cooperation with the West.

The U.S. civilian space program, which is a technological cousin of the military space effort, is deeply concerned with toeing a line that will not give the Soviets any pretext for regressing to their previous shut-in policies. The Soviets, of course, do not require a pretext if they choose to revert, but NASA is determined to prove that it is going into space cooperation in good faith.—D. S. GREENBERG.

Federal Aid to Education: How Much and Where It Is Going Now under Study by House Committee

How much money does the federal government spend annually on education and where is the money going?

It would seem to be a reasonable assumption that somebody has the answers, but the conclusion of people who have looked into the matter is

that nobody really knows. The U.S. Office of Education regularly issues a fairly detailed compilation of what other federal agencies are doing about education, but, according to people in the Office of Education, a number of agencies look askance at its surveys. The reasons for this, says the Office of Education, are that (i) the Office does not rate high enough in the federal hierarchy to command the attention of all other agencies and (ii) a number of agencies are suspicious of the Office of Education's motives, possibly viewing a request for information as the first step toward aggrandizement. The Administration's annual budget report is of little assistance, since agencies frequently have considerable discretion on the use of funds, and money may be going into a fellowship program or an in-service training program without the expenditures specifically listed in the budget.

Whatever the amount of federal aid to education—whether in scholarships, fellowships, research contracts, or otherwise—the money involved is widely thought to bring considerable pressure to bear on many parts of the nation's educational system. For example, the abundance of federal money for graduate science studies makes a poor relation of many humanities departments, which receive scarcely any direct federal support; inadequate reimbursement for the indirect costs of government research diverts university funds that might have gone elsewhere; a variety of federal agencies fish in the same manpower pool, offering stipends that vary by several thousand dollars, without any regard for a broad view of the nation's specialized manpower needs.

A comprehensive survey of federal aid to education, from elementary schools at Air Force bases through fellowships in physics, is now being made by the House Education and Labor Committee. The survey, under the direction of Rep. Edith Green, arose from the pique of Chairman Adam Clayton Powell when he reportedly discovered that education was being legislated in virtually every House committee, without any committee showing very much interest in the activities of its neighbors. The survey is expected to be completed early next year, and it should provide for the first time a good picture of the present patchwork approach on federal aid to education.—D.S.G.

Announcements

An **International Institute of Volcanological Research** has been established in Sicily as a joint project of Italy's Instituto di Vulcanologia (IV), the Centre National de Volcanologie (CNV) in Brussels, and the International Association of Volcanology. The institute, headed by A. Rittman, director of the IV, was formed partly as a matter of convenience between Belgian and Italian interests: Belgium, since loss of the Congo, no longer has active volcanoes to study although CNV funds for volcanological research still exist; Italy, however, has several active and inactive volcanoes, but the IV lacked even the necessary funds to cover administrative expenses during 1960 and 1961.

Students or visiting investigators with self-supported programs are invited to use the institute's facilities, which include specialized equipment and two field stations located on Mount Etna. (IIVR, Corso Italia 55, Catania, Sicily)

The American Phytopathological Society has released summarized results of 1961 **fungicide and nematocide testing projects**. Information on composition and sources of products available for testing is included in the report. (A. B. Groves, Winchester Fruit Research Laboratory, 2500 Valley Ave., Winchester, Va. $1)

A manual on the use of **computers in biomedicine** has been published by the University of California (Los Angeles). The 200-page book presents various categories of package programming, including regression, multivariate analysis, tabulating, screening and plotting, and time series analysis. (Student Store, UCLA, 308 Westward Blvd., Los Angeles 24. $3.75)

Meeting Notes

The first annual summer seminar on **alpine tundra ecology** will take place from 25 to 30 June at Estes Park, Colo. Sessions, limited to 40 participants, will be devoted to alpine environment, history of the flora, plant functions in extreme environments, and fauna and vegetation ecology. Registration fee is $10. (Bettie Willard, Institute of Arctic and Alpine Research, Box 1258, Estes Park)

A conference on the design of **prosthetic communication machines** will be held on 16 May in New York, to encourage the development of a series of talking and writing machines for paralytics. The conference will cover an evaluation of particular patients' requirements, and specifications and engineering-design proposals for components or complete systems. (Carl Berkley, Foundation for Medical Technology, 2 E. 63 St., New York 21)

Papers and scientific exhibits are invited for presentation at the 1962 **International Symposium on Space Technology and Science**, to be held in Tokyo from 27 to 31 August. Deadlines: 10 June (titles); 10 July (100-word abstracts). (Fumio Tamaki, Institute of Industrial Science, University of Tokyo, Shin-Ryudo-cho 10, Minato-ku, Tokyo)

The University of Mississippi is sponsoring a conference on **industrial uses of radioisotopes**, to be held on the campus from 6 to 8 May. An accompanying exhibit will consist of equipment adapted for such uses and for radiation detection and measurement. (Department of Conferences and Institutes, University of Mississippi, University)

The National Science Foundation is sponsoring a summer conference for college teachers of the **history of mathematics**, to be held from 25 June to 20 July in Ann Arbor, Mich. The purpose of the conference is to provide experience with source materials and research procedures as well as background study in the field. Deadline for applications: *1 May*. (Phillip S. Jones, Department of Mathematics, University of Michigan, Ann Arbor)

An international symposium on **food protection** will be held from 10 to 12 May at Iowa State University. Discussion topics will cover chemicals in foods, significance of various microorganisms in food products, bacterial toxins, antioxidants, animal growth regulators, and other areas related to food safety. (J. C. Ayres, Department of Dairy and Food Industry, Iowa State University, Ames)

Papers are being solicited for presentation at the 15th annual conference on **Engineering in Medicine and Biology**, to be held in Chicago from 4 to 7 November. Deadlines: *1 June* (50-