he remarked: "From Nobel I get praises but not prizes." Fortunate were those who could understand his native language, for he was a raconteur par excellence, drawing his stories from the reservoir of Russian folklore and personal experiences.

No human life is free of misfortunes, and Ipatieff had his share. His oldest son, Dimitrii, gave his life in World War I; his second son, Nicolai, died in the Belgian Congo while experimenting with a new antimalarial drug. Cut off from his country, his children forbidden to communicate with him, he suffered greatly. With deep concern he followed the events of World War II when his country was invaded by Germany and he was unable to help her. Two of his grandsons perished in the war.

Ipatieff's philosophy of life is best expressed in a passage in his autobiography: "Scientists should be very modest in evaluating their achievements and realize, although they have devoted their whole life to science and in spite of their great discoveries, that they play a relatively small part in the progress of scientific knowledge whose problems are illimitable. A true scientist derives his greatest satisfactions in handing on his ideas to others for further development."

On 29 November 1952, while awaiting the arrival of the writer of this article to discuss some problems of the laboratory, he passed away suddenly. His wife followed him 10 days later.

NEWS AND COMMENT

Space Budget: Congress Is in a Critical, Cutting Mood

The political atmosphere surrounding the U.S. space program is today murkier and less hospitable than at any time since 1961 when President Kennedy decided to send men to the moon. This does not necessarily mean that NASA is in any danger of falling off of its $5-billion-a-year budgetary plateau (give or take a few hundred million). But it is clear that, where Congress is concerned, the agency has lost much of its innocence and therefore its plans are to be reviewed with the caution and skepticism reserved for, say, a new farm-subsidy scheme.

Before looking at the recent House and Senate actions on space legislation, consider for a moment the short but dynamic history of the space program. Born during the intense cold-war rivalry of the late 1950's, the program was—and is—cheered on by a public and a Congress moved by excitement, patriotism, and a Hollywood taste for supercolossal productions. Scientific interest has helped advance the space effort, but, by much of the public, the U.S. and Soviet space programs seem to have been regarded as a kind of celestial stock-car race.

The unbroken string of successful manned orbital flights of the Mercury and Gemini projects created a euphoric mood and led to the assumption that the vastly more difficult Apollo flight to the moon would be accomplished without mishap. The loss of a three-man Apollo crew in the spaceship fire last January was NASA's first real setback. Weaknesses in the NASA management were exposed. The garrulous and sometimes evasive and testy manner of Administrator James E. Webb before congressional committees investigating the Apollo fire produced a greater awareness that NASA, like other agencies, is not beyond confusing its public image with the public interest.

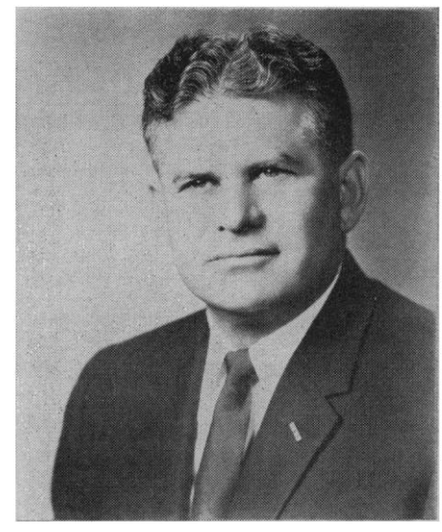
However, by its massive spending program of the last 5 years, NASA has acquired a lot of devoted friends. As a gigantic engineering project, Apollo has brought contracts and profits to thousands of companies and has become the economic mainstay of a number of communities such as Huntsville, Alabama (*Science*, 10 March), and Brevard County (Cape Kennedy), Florida.

Some members of Congress are remarkably frank in indicating that their principal interest in the space program lies in the economic benefits it brings their districts. In the recent House debate on the space bill, a congressman from the Los Angeles area, which has been thriving on space contracts, compared the economic effects of the space effort to those of military build-ups. "This country of ours became strong and grew wealthy while it was doing things all of us would agree are not sensible to do," he said. A New Orleans congressman, F. Edward Hébert, whose area benefits from NASA dollars spent at the Michoud Saturn assembly plant, said "I am unalterably opposed to the so-called giveaway programs, the so-called poverty programs, the so-called do-good-here and do-good-there programs. . . . Not one of those programs produces a single item of income . . . [But] every dollar put into the [space] program comes out in a productive manner. . . ."

The deep involvement of university scientists and engineers in Apollo and in NASA's scientific programs (which, though small by comparison with Apollo, involve hundreds of millions of dollars) has extended the NASA constituency still further. Speculation concerning NASA's prospects must take into account the strength of this multifarious constituency and the tendency of the administration and Congress to continue to recognize the budgetary claims of a new agency once it has become established. Inertia and the politician's desire to avoid conflict are factors always working for a more or less stable, if not a rising, agency budget. Indeed, one might be justified in predicting that the major budgetary struggles of the future will be less concerned with how much money NASA gets than with how NASA spends the money it does get. The principal contestants could turn out to be, on the one hand, a NASA officialdom dominated by people largely interested in spectacular manned space flights and engineering feats and, on the other hand, scientists interested in the advancement of knowledge and their professional reputations.

The great momentum achieved by an ongoing program, on which billions of dollars already have been spent, is evident from the fact that Congress probably will provide nearly all of the $2.5 billion NASA has requested this year for Apollo. The NASA budget of

Representative Fulton of Pennsylvania . . . . leads in cutting space bill.



Representative Teague of Texas . . . . accuses Fulton of a "doublecross."

$5.1 billion will be cut by a quarter of a billion or more, but the reductions are likely to be felt most by NASA's scientific and post-Apollo programs. Moreover, it seems probable that the strictly scientific efforts will be hurt more than post-Apollo activities designed to make maximum use of Apollo hardware and to prepare for eventual manned planetary flights.

For NASA to get its funds for the new (1968) fiscal year which started 1 July, Congress must, of course, first enact an authorization bill and then an appropriations measure. The first step is now well along. Before the 4th-of-July recess the House and Senate passed authorization bills which would establish appropriation ceilings. The measures were not identical, however, and the differences between them will have to be reconciled by House-Senate conferees.

Although the actions taken by the House and Senate thus far are not definitive, they would be worth examining if only for what they reveal of the politics of the space program. Besides this, however, witnesses to the House action saw some extraordinary Republican maneuvers which ranking Democrats on the space committee fear will result in a major setback for a variety of unmanned scientific flights. At least one key Democrat is alleging a "doublecross."

Playing the leading role in these events was Representative James G. Fulton of Pennsylvania, the ranking Republican on the Science and Astronautics Committee. The minority leader, Gerald R. Ford of Michigan, and the minority whip, Leslie C. Arends of Illinois, looked largely to Fulton for leadership in urging the House to make cuts in the space authorization bill. Fulton's reputation among some of his colleagues as a talkative, aggressive, mercurial personality lost nothing from his behavior on 28 June, when the House wound up 3 days of deliberations on the space bill.

Fulton had offered an amendment to cut from the "Apollo Applications Program" (AAP) $250 million which would be spent on the production of NASA's big boosters, the Saturn I and the Saturn V. AAP (*Science*, 3 March) is to include activities such as extensive manned lunar exploration and the establishment of an orbital workshop. The workshop would (i) permit tests of man's ability to withstand the stresses of prolonged space flight and (ii) enable astronauts to attend to a variety of scientific packages, such as the Apollo Telescope Mount (ATM) and possibly a package for obtaining data on earth resources. Fulton said that, if the Apollo program itself is successful, enough big boosters will be left over for AAP to permit the production cut he proposed.

On the other hand, he indicated that, if the first few Apollo flights should fail, the Saturn V would have to be considered unworthy of its assigned AAP tasks. This argument was attacked partly because it ignored the possibility that Apollo could run into troubles not associated with the booster.

The $250-million cut that Fulton advocated would have removed more than half the AAP research and development funds. Another Republican on the space committee, Richard L. Roudebush of Indiana, proposed a cut in AAP of only $65 million. There was conferring between Republican and Democratic leaders, and a deal of sorts seemed to have been struck. Knowing that its adoption would forestall any further attempts to cut AAP, Olin E. Teague of Texas, chairman of the space subcommittee responsible for the program, said he would not oppose the Roudebush proposal. Fulton himself indicated he was resigned to a smaller cut in AAP than the one he wanted. The Roudebush amendment was handily adopted.

Later, however, as action on the bill was being concluded, Teague and other Democratic leaders on the space committee were dismayed to find Fulton proposing cuts totaling $136 million in the heart of NASA's scientific and R & D program. Moreover, the Republican leaders, on Fulton's advice, were supporting the reduction. The cut, adopted by a vote of 238 to 157, had the support of a mixed bag of congressmen acting from a variety of motives.

Some were perennial economizers eager to strike a blow at "moondoggling," especially now when the Vietnam war raises the prospect of a record budget deficit. Some were liberals chafing at the thought that the space program was getting money they would rather see go to education and antipoverty programs. Others were congressmen who had come to regard NASA as an overgrown bureaucratic empire whose management deficiencies were made manifest by the Apollo spacecraft fire. For those worried lest another mishap occur, the Fulton motion may have had special appeal, as it provided for NASA to appoint a panel of outside safety advisers. Creation of the safety panel is one of two steps contemplated by the House as a way of keeping NASA under closer surveillance. The other, provided for in the space bill as reported from committee, is adoption of a requirement that NASA keep the House and Senate space committees "fully and currently informed." (Partly on the strength of similar legislative language, the Joint Committee on Atomic Energy has played a forceful, often decisive role in the running of the Atomic Energy Commission.)

The effect of Fulton's cut was to

NEWS IN BRIEF

• **NASA ADVISORY BOARD**: The National Academy of Engineering has established an Aeronautics and Space Engineering Board to advise the National Aeronautics and Space Administration. Patterned after the National Academy of Sciences Space Science Board, the new board will operate under a contract with NASA. Dr. H. Guyford Stever, president of the Carnegie Institute of Technology, will serve as board chairman, and Colonel Robert J. Burger, retiring executive secretary of the Scientific Advisory Board at U.S. Air Force Headquarters, Washington, D.C., will be executive director. The board will make recommendations to the government on engineering priorities, use of engineering talent, and improvement of aerospace engineering education.

• **NEW YORK EDUCATION**: New York has increased its appropriations for higher education by 481 percent over the last 8 years, placing it well out front in the nation, according to a survey by an Indiana University professor. M. M. Chambers reports in the June issue of *Grapevine* that the average 8-year gain in the 18 states which have reported appropriations for next year is 252 percent. For the State University of New York, Chambers calculated, the 2-year increase between 1965–66 and 1967–68 has been 80 percent, compared with an average 2-year gain of 50 percent in the other states. New York was the only state with public institutions that received an "A" rating on both scales in the recent salary survey by the American Association of University Professors.

• **MEDICAL DEVICES SAFETY ACT**: The administration has proposed a Medical Devices Safety Act which would place certain classes of new medical apparatus under the control of the Food and Drug Administration. The bill (HR 10726) has been introduced in the House by Harley O. Staggers (D–W.Va.), chairman of the Committee on Interstate and Foreign Commerce, to which it has been referred. Provisions of the proposed act include mandatory standards on composition, properties, or performance of certain medical devices such as bone pins and catheters; premarket clearance of unproved devices such as organ substitutes; and registration and inspection of device manufacturers. The act also provides for an independent advisory committee, nominated by the National Academy of Sciences, to hear appeals on standards and premarket clearance decisions. Two other bills, HR 6165 by Edwin Reinecke (R–Calif.) and HR 7621 by Don Fuqua (D–Fla.), call for a national commission to study quality controls and manufacturing procedures for medical devices and determine to what extent Federal regulation is necessary.

• **NATIONAL LIBRARIES COORDINATION**: The three national libraries have formed a task force to plan the establishment of a national computerized catalog information center. The first step in the coordination effort will be standardization of cataloging systems so information from each library can be fed into a common data bank. The Library of Congress and the National Library of Medicine are currently making limited use of computers and the National Agricultural Library is conducting an automation study. The proposed data bank would serve as a reference source for all libraries in the nation and could be used to produce indexes and bibliographies for other libraries. The joint effort will also include a national data bank of serial titles held by American research libraries so that scholars can locate publications anywhere in the United States.

• **SALMON SEMANTICS**: Producers of salmon, the fish, say sales of their product are suffering from confusion with salmonella, a stomach-turning bacterium. Their solution, as proposed in a bill introduced by Senator Warren Magnuson from salmon-producing Washington State, is to revise bacterial nomenclature: under the bill, salmonella, named after its discoverer, Daniel Salmon, an American veterinarian, would become "sanella," and all federal agencies would be required to refer to it as such. Magnuson says the change is logical because his proposed terminology relates to "sanitation," the lack of which usually causes the disease. Magnuson called the confusion "unfortunate" and said it was not his intention to "detract from the good work of Dr. Salmon, or to deprive him of credit due for his discovery."

(i) eliminate the $6.2 million earmarked for studies on advanced manned-space-flight concepts; (ii) reduce the money available for nuclear-rocket development (work which Fulton had extolled as a means of avoiding obsolescence in NASA booster technology); (iii) eliminate an extra $10 million which the committee had added to the $20 million NASA had requested for its university sustaining program; (iv) reduce from $71.5 million to $50 million the money authorized for beginning work on an unmanned Voyager mission in 1973—a mission to place a spacecraft in orbit around Mars and to land an automated laboratory on the Martian surface; and (v) reduce from $150.7 million (the amount allowed by the committee) to $72 million the money authorized for procurement of the small and medium-sized launch vehicles, such as Scout, Delta, Atlas Agena, and Centaur, used in launching scientific satellites.

There was little discussion of the meaning and likely consequences of these cuts. Certainly Fulton gave no intimation of his strategy which, as he now describes it, is to use the reductions as a bargaining lever when the House-Senate conferees meet. "When we come to the conference," he told *Science*, "I will offer to negotiate on the items cut in order to get a change in the Saturn scheduling." (Although several fewer Saturns would be manufactured under Fulton's plan, the rate of production would be stepped up for those which are needed; this, he says, would save large sums.)

At best, Fulton's strategy seems likely to give him only a small part of what he wants, while leaving large cuts affecting such things as the procurement of rockets for scientific missions. It appears that, under the rules of the House, AAP (including production of the Saturn boosters) can be cut no more than an additional $45 million, for the Senate authorization for AAP is lower than the House figure by only that amount. Moreover, Teague is concerned that, even with the $65-million cut in AAP, the program will be hurt. He will be reluctant, and perhaps unwilling, to go along with Fulton's strategy. In fact, he and Fulton may have trouble sitting at the same conference table. "Jim Fulton double-crossed us," he says, "and I am going to tell him that to his face everytime I see him."

Representative Joseph E. Karth of Minnesota, chairman of the Space Sciences and Applications Subcommittee,

also denounces Fulton's action. If Fulton knew more about the unmanned space program, Karth says, he would be aware that there is only one launch vehicle for each satellite to be launched. "We were very discreet in our cuts [in committee]," he adds. "We went at it with a surgical instrument, rather than with the meat ax used by the gentleman from Pennsylvania. We could have a couple million dollars worth of satellites waiting for launch vehicles."

Karth is worried, too, about the effect of the Fulton cuts on Voyager. The Senate cut out all funds for Voyager, thus ratifying a decision of its Aeronautical and Space Sciences Committee that this costly program ($2.3 billion, by NASA estimates, for the 1973 and 1975 Voyager missions) should be deferred in view of the budgetary situation. Now that the House has reduced the Voyager authorization from the $71.5 million NASA requested to $50 million, Karth is in a weaker position for bargaining with Senate conferees for an authorization large enough to enable NASA to take advantage of the 1973 "launch window."

Karth fears that the NASA request itself was too small to permit a 1973 launch. A $50-million authorization—now the maximum possible—will make it harder to meet this schedule, though Fulton insists that such an authorization would be adequate.

Besides cutting out the Voyager funds, the Senate, on the advice of its space committee, eliminated $10.1 million that NASA would use to start work on a two-flight Mariner flyby of Mars in 1971. The 1971 Mariner mission, following up the Mariner-Mars flight scheduled for 1969, would include atmospheric probes, which would contribute substantially to its estimated cost of $216 million. The committee questioned whether enough information would be produced to justify the mission's high price. For the 1970's, the committee suggested, NASA should schedule Mariner flights (without atmospheric probes) for the investigation of Mars, Venus, and other planets and conduct a complementary program of small interplanetary probes.

Actions and pronouncements of this kind by a congressional committee frequently are influenced by a desire to wield maximum leverage in bargaining in the House-Senate conference. Sometimes a committee recommends that a program be cut out entirely when what it really expects to accomplish is to take a slice off the program budget. The Senate space committee acted in the belief that the House would cut neither the Voyager nor the Mariner programs. If the House-Senate conferees should agree to authorize appropriations for both these programs it will be no surprise.

Some critics of NASA maintain that, with the peak of Apollo spending now past, the agency is influenced, in its post-Apollo planning for both manned and unmanned flights, by its desire to keep a high budget and to show that its huge investment in Saturn rockets was, and is, justified. AAP, with its lunar missions, orbital workshop, and telescope mount, would depend upon Saturn boosters. So would the Voyager missions. A Saturn-launched mission, if only because of the cost of the launch vehicle, entails major expenses which are avoided in missions, such as those of the Mariner class, where smaller rockets are used.

According to the Senate space committee, the number of missions planned by the Office of Space Science and Applications (OSSA), which runs NASA's unmanned scientific flight program, decrease sharply in the early 1970's—from 21 in 1967, to about 13 in 1970, to 2 in 1973 (the Voyager "orbiter" and the Voyager "lander"). Voyager, by demanding more than $300 million a year from fiscal 1969 on, will crowd out most other flights unless the OSSA budget is substantially increased, the committee indicated.

Moreover, while the space panels of the President's Science Advisory Committee have endorsed NASA's plans for Voyager, at least a few panel members believe that, technologically speaking, 1973 will be too early to attempt a soft landing on Mars. This opinion is held by both Gordon J. F. MacDonald, professor of geophysics now on leave from UCLA to serve as vice president for research at the Institute of Defense Analyses, and Bruce C. Murray, associate professor of planetary science at Caltech. Noting that Voyager cannot escape a budget cut this year, Murray told *Science*: "In budget cutting the difficulty is that carefully worked out alternative programs may not be available to Congress. For example, one possible way to have a good planetary exploration program and yet avoid for the next 2 fiscal years the increased cost necessarily associated with a Voyager-lander would be to develop only the orbiter portion of Voyager. The orbiter mission does not involve the expensive technology required for sterilization and atmospheric entry. The Voyager-lander effort could be delayed until 1975. This delay only makes sense, however, if high priority is given the 1971 Mariner mission. The cost-effectiveness of the 1975 Voyager effort would be greatly enhanced because of the experience with sterilization and atmospheric entry of a simple payload gained from Mariner. Futhermore, this procedure may allow greater freedom to pursue Mariner pioneering missions to sample directly the atmosphere of Venus in 1972 and perhaps get a first look at Mercury in 1973."

Matters are still unsettled, and plans for NASA's planetary explorations beyond 1969 and for some of its other scientific investigations are not now predictable. Whether things go well or badly, however, the space science program is sure to be influenced by haphazard tactical and political maneuvering—certainly in Congress and perhaps within NASA as well.

—LUTHER J. CARTER

Communication Gap: LBJ's Monologue with the Intellectuals

"Now I am the most denounced man in the world."—President Johnson

Just as Captain Ahab tied his fate to the pursuit of Moby Dick, the white whale of the Pacific, so has Lyndon B. Johnson tied his Presidential reputation to the pursuit of the Vietnam war. One difference, however, is that President Johnson's crew is generally more apprehensive than was that of the *Pequod*.

The President is aware that some of the more intellectual types under his care are in violent disagreement with the course he is steering. In mid-May the President called together 16 leading "intellectuals" in the Administration for a luncheon discussion of how to improve his standing in the nation's