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JOINT MOON TRIP PROPOSAL ADDS TO NASA'S TROUBLES

President Kennedy's U.N. speech of September 20, suggesting U.S.-Soviet cooperation in space, including a joint expedition to the moon, has produced immediate trouble for the current NASA budget and considerable doubt about any U.S. "goal" of achieving a manned moon flight by 1970.

The generality of the President's proposal, followed by remarkably vague clarifications from other officials, has left the field open to speculations of all kinds. One widely discussed possibility, that this is the first step in a graceful retreat from the original commitment to a moon landing within this decade, has been supported by evidence of technical difficulties and rising cost estimates in the Apollo Project. Another notion, that the Russians may have no comparable program and that we are racing only against ourselves, also has its supporters. (N.Y. Times, 9/21.)

Into this confusion, Congressional economizers have moved with their usual efficiency. NASA's budget, which had already been reduced to \$5.35 billion from the Administration's request for \$5.7 billion, was cut further to \$5.1 billion in the appropriation finally passed by the House. The budget cut was made despite appeals by President Kennedy and by NASA chief James E. Webb, who argued that a budget at this level would delay the Apollo program beyond its 1970 deadline and add several billions to the estimated \$20 billion total cost.

On the floor of the House, Rep. Louis C. Wyman (R., N.H.) proposed a further cut of \$700 million (and argued for increased military space efforts). This move was defeated, 47-132.

The House added a last-minute amendment by Rep. Thomas M. Pelley (R., Wash.), which bars any use of NASA funds for a cooperative moon program involving any Communist or Communist-dominated country. (N.Y. Times, 10/11.)

NASA's budget is now up for hearings before the Senate Appropriations Committee, where its future looks no rosier. Senator J. W. Fulbright, who has previously criticized the high priority given to the moon project, has now called on Congress to reduce its budget "substantially", to end the race with the Russians for the moon and to reallocate the savings to education and employment programs now before Congress.

If, by 1970, he said, the Russians have reached the moon while the United States has built the best system of public education, renovated its cities and alleviated poverty and disease, "who would then be ahead in the worldwide struggle for the minds of men?" (N.Y. Times, 10/18.)

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U.N. ACTS TO BAR SPACE WEAPONS

The U.N. General Assembly has adopted, by acclamation, a resolution intended to prohibit the orbiting of weapons of mass destruction. The action followed an announcement on October 3 by the United States, Soviet Union, and Great Britain that the three Governments had agreed in principle to such a ban. Earlier discussions by Secretary Rusk, Andrei Gromyko, and the Earl of Home led to more detailed talks between William C. Foster, director of ACDA, and Nikolai T. Fedorenko, chief Soviet delegate to the U.N., who worked out the text of the resolution.

The resolution "welcomes the expressions by the U.S.S.R. and the United States of their intentions not to put any objects carrying nuclear weapons or other weapons of mass destruction into outer space," and "solemnly calls upon all states to refrain from placing in orbit around the earth any objects containing nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner." Accompanying statements by Ambassador Stevenson and Fedorenko affirmed their nations' intent to abide by the ban. Mr. Stevenson called the resolution "another decisive advance in the disarmament process."

The step was generally welcomed as a modest effort to keep the arms race out of space: the parallel unilateral declarations do not have the force of a treaty or even an executive agreement, and are not binding on either Government. However, Senator Goldwater blasted the action as "an open and flagrant assault" on U.S. national security and as "blatant usurpation by the Executive of the advice and consent powers" of the Senate.

Officials pointed out that the agreement by no means puts an end to all military activities in space. The U.S., for instance, is not prepared to give up the use of satellites for reconnaissance and for weather research of military value. (N.Y. Times, 10/10, 10/16 & 17; W. Post, 10/18.)

PEACE PRIZE TO PAULING

Dr. Linus Pauling has been awarded the Nobel Peace Prize for 1962. Dr. Pauling had previously won the 1954 Nobel prize for chemistry. The announcement of the peace prize gave, as usual, no reasons for the award, but it was assumed to recognize Dr. Pauling's years of effort to halt nuclear testing, and his calculations on the biological effects of fallout.

A week later, Dr. Pauling announced that he is leaving the California Institute of Technology, where he has been for 41 years, to join the Center for the Study of Democratic Institutions at Santa Barbara, California. The Center's activities include studies of the impact of science, technology, and war on democratic society. (N.Y. Times, 10/11; W. Post, 10/19.)

FALLOUT SHELTER FUNDS CUT

The House Appropriations Committee maintained its long opposition to a fall-out shelter program when it refused to appropriate \$195 million previously authorized by the House of Representatives. This money was to have been spent for developing shelters in non-profit public and private institutions and in Federal buildings. Also deleted from the civil defense budget was an additional \$64 million for stocking shelters and maintaining certain existing programs. A greatly reduced total of \$87.8 million was approved for support of established civil defense programs.

The Appropriations Committee attitude was summarized by Rep. Albert Thomas, "This program has been authorized since 1950. We haven't changed our minds. We're not building any fall-out shelters, period."

"NEW PERSPECTIVES ON AMERICAN SECURITY"

(Last August 2, in a Senate speech under the above title, Senator George McGovern of South Dakota presented arguments which led him to favor substantial reductions in defense spending. Excerpts below are from his lengthy analysis of "overkill" capacity and the limitations of "counterforce" strategy. As noted in this Newsletter, the Senate overwhelmingly rejected a proposal by Sen. McGovern to reduce appropriations for 1964. Sen. McGovern has also submitted a bill dealing with his proposals for conversion from a "defense economy.")

"First. The United States now has a stockpile of nuclear weapons in excess of any conceivable need.

"Second. Bringing the arms race under control involves risks less dangerous than the proliferation of nuclear warheads and the acceleration of the arms race.

"Third. Present levels of military spending and military foreign aid are distorting our economy, wasting our human resources, and restricting our leadership in the world.

"Fourth. Diverting some of our present and proposed military spending to constructive investments both at home and abroad will produce a stronger and more effective America, a more secure America, and will improve the quality of our lives and strengthen the foundations of peace. . . .

"As a nation we have rejected both the concept of aggressive war and passive surrender. We have operated from the premise that the Communist threat is checked only because of our awesome military machine. This is the theory of deterrence which has guided our thinking for most of the period since World War II. When one looks for a more specific answer as to how that policy would be applied in the form of military strategy, he encounters some rather confusing and conflicting assumptions. . . .

REALITIES OF SOVIET-AMERICAN OVERKILL

"I think it is imperative that every American fully understand what our Secretary of Defense has told us [in testimony before House Armed Services Committee, Feb., 1963]. If nuclear war comes—no matter who strikes first—both sides will count their losses in tens of millions of human lives. There is no such condition as true nuclear superiority in the sense that either the United States or Russia could escape mass destruction should it attack the other. Hardened ICBM sites and nuclear-armed submarines have made the so-called counterforce and no cities doctrines obsolete before they were fully expressed. . . .

"It might be argued by some that our excessive nuclear spending serves an indirect purpose in that it forces the Soviets to strain their less affluent economy to match our effort. But the Russians, from all indications, seem to be avoiding construction of highly sophisticated weapons beyond what they regard as enough to destroy the United States in the event of war.

"During the late 1950's when the Soviets could have built hundreds of the latest types of long-range bombers they constructed less than 200 as against our more than 1,600. There is no indication that they intend to try to narrow this gap. At the present time, while we have a capability of a thousand ICBM's—perhaps considerably more—and are building many more, the Russians have built only a minor fraction of that number. Indications are that they will improve and replace rather than greatly increase the number of their missiles. . . .

"I think we need to take another careful look at our enormous arms budget, asking ourselves: What part of this budget represents additions to an already surplus overkill capacity? What alternative uses can be made of surplus military funds for strengthening the economic and political foundations of our society? . . .

"I believe that, in addition to a cut of \$1 billion in the Atomic Energy Commission's weapons procurement program, we could wisely cut an additional \$4 billion from the proposed budgets of the Air Force, Navy, and Army without reducing the security of the Nation. Indeed, such reductions could enable us to strengthen our overall national security. Any such substantial cut should, of course, be applied and administered with the expertise of the Secretary of Defense. . . .

ECONOMIC CONVERSION

"It may be argued that the economy of many of our communities has become so intertwined with military spending that an arms cut of several billion dollars which I have proposed would result in a painful economic dislocation.

"It is true that many American communities have come to lean heavily on the economic stimulus of arms production

\$47.2 BILLION FOR DEFENSE

Congress has passed the annual defense appropriation bill, totaling \$47.2 billion for fiscal 1964. The amount is about \$1.8 billion less than the Administration's request, and a billion below the record peacetime appropriation for 1963. The final figure was a compromise between a lower House and higher Senate appropriation. (Total defense costs will be several billions more, including a pay rise for the services.)

The Senate's unanimous approval of the appropriation, just after its vote on the test ban treaty, reflected strong emphasis on maintaining U.S. armed strength. Several efforts to cut appropriations were defeated; the campaign by Senator George McGovern (D., S.D.) to reduce weapons procurement and research and development funds by 10% (over \$2.2 billion) was supported only by Democratic Senators Randolph of West Virginia and (in absentia) Morse of Oregon.

During the next year, however, defense programs and budgeting apparently will be in for intensive review.

The Administration faces major, controversial decisions bearing on "the shape and size of the defense budget in future years, and, eventually, upon the roles and missions of the services." Examples are the Air Force role in space, future manned bombers, and the Navy's aircraft carriers. The scale of military research and development is reported likely to decline substantially. (N.Y. Times, 10/16 & 18.)

Congress also is undertaking new studies or hearings on problems relating to defense policies, armed services and weapons, and arms control. For example, a manpower subcommittee headed by Sen. Joseph Clark (D., Pa.) plans hearings soon on employment aspects of arms reduction. (W. Post., 9/14.)

and military installations. We need to accelerate and expand our efforts on the Federal, State, and local level to prepare these communities for a conversion to a more permanent economy appropriate to the conditions of peace. . . .

"I recommend the following procedure:

"First, all establishments that fulfill Defense Department or Atomic Energy Commission work for at least 1 calendar year and whose personnel are 25 percent or more so engaged, should henceforth be required—as a condition of contract fulfillment and acceptable administration—to establish in their managements an operating conversion committee. This committee should actively engage in planning for conversion of the facility from military to civilian work as required in the event of termination, cutbacks, stretchout, or other curtailment of Defense or AEC requirements.

"Second, in order to estimate the support that may be required to complement local and regional conversion, an Economic Conversion Commission should be established by the President under the direction of the Secretary of Commerce and including experts from other concerned Government departments. Our Arms Control and Disarmament Agency already has a small but able group of people giving thought to this matter.

"The Economic Conversion Commission shall have responsibility for blueprinting appropriate action by departments and agencies of the Federal Government that are required to facilitate conversion from a military to a civilian economy.

"In addition to such activities as it should deem necessary, the Commission would prepare schedules of possible private and public investment patterns and the employment and income effects to be expected therefrom. The information would be reported to the President and to the Congress in preliminary form within 6 months after the enactment of authorizing legislation and in final form within 12 months.

"The Commission would take counsel with the Governors of all States to encourage appropriate and timely studies and conferences by the States in support of conversion from a military to a civilian economy.

"Third, the Commission would, within 12 months of establishment, convene a National Conference on Economic Conversion and Growth to focus nationwide attention on the problems of conversion and economic growth and to encourage appropriate study and organization in all relevant parts of the Nation's economy. This conference should include invited representatives of trade associations, trade unions, professional societies, representatives of appropriate agencies of the Federal and State Governments, and selected individuals with specialized knowledge.

"Through intelligent planning we can make a satisfactory transition to an economy less dependent upon arms spending. . . ."

PUGWASH CONFERENCE

The eleventh Pugwash Conference on Science and World Affairs was held in Dubrovnik, Yugoslavia, September 20-25, with participation by 64 scientists from 24 countries. The main topic discussed was "Current Problems of Disarmament and World Security." The following recapitulation of some proposals considered by working groups is taken from the summary issued by the Continuing Committee of the Pugwash Conferences.

Two suggestions were made relating to the prevention of surprise attack in central Europe. First, it was suggested that control posts be set up at major transportation centers within agreed areas. Such posts would give warning of any attack by conventional arms, which would involve the transport of large numbers of men and weapons. Second, it was suggested that NATO and the Warsaw Pact countries should exchange military observers, who would be stationed and reside with the troops of the other side within the agreed areas. These observers would have adequate means of communicating with their own governments.

On disarmament, the conferees discussed as a first step the destruction of nuclear delivery vehicles down to "minimum deterrent" levels, which would be sufficient to deter, but not to launch, a major thermonuclear war. Creation of a permanent International Disarmament Organization, to control and inspect the process of disarmament, was also supported. While the possibility of cheating was considered to have been overrated, such an inspection system could do much to allay fears that cheating might occur.

The scientists also showed concern with preventing the spread of nuclear weapons which might result from development of nuclear reactors in many countries. More effective controls over fissionable materials were endorsed, and their transfer and control via the IAEA, rather than bilateral agreements, won support. To avoid wasteful duplication, international centers for peaceful nuclear technology, including power reactors, were also suggested.

There was further discussion of atom-free zones, involving the Balkans, Africa, Latin America, and, with special emphasis, central Europe.

The conferees also expressed their support of extending the test ban. Scientists were urged to "take every opportunity to influence public opinion so that the test-ban treaty shall be adhered to by all nations (including France and the People's Republic of China)." It was feared that "any further tests in the atmosphere, water, or outer space would not only increase radioactive fallout, but could also contribute to the breakdown of the test-ban treaty and to a further escalatory series of atomic tests."

For an eventual extension of the ban to underground tests, intensified seismological research, including international collaboration, was proposed. An international seismological station, to be established in a "politically suitable and seismologically quiet area," was also suggested.

HARMONY IN THE IAEA

The International Atomic Energy Agency ended its seventh annual general conference with East-West agreement on a nuclear-reactor inspection system. With the Soviet bloc voting solidly for approval, delegates from the 87 member states overwhelmingly voted to extend the agency's safeguards system to large nuclear reactors. The agency's board of governors will work out the technical aspects of the extension by February. The extended system is expected to go into effect later next year.

The safeguards system is designed to prevent any diversion of nuclear equipment or materials supplied through the agency from peaceful uses to the production of weapons. In the past the safeguards system has applied only to small reactors of less than 100 thermal megawatts. These are used chiefly for training and research and the production of relatively unimportant quantities of plutonium, a weapons material. With the extension, the system also can be applied to large power reactors that produce significant amounts of plutonium. Several facilities of this kind are under construction in various parts of the world.

Agreement on the extension does not mean that all such reactors will automatically be subject to the agency's safeguard procedures. Only reactors supplied through the agency or turned over to its supervision by participating nations will be affected. Thus, the Russians, despite their vote, will not be required to open their nuclear facilities to agency inspectors. Nevertheless, in the past the Soviet Union con-

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SCIENTISTS CRITICIZED

(The Center for the Study of Democratic Institutions, of the Fund for the Republic, recently published a collection of papers, from a conference on the role of science executives in government, under the title, "Science, Scientists, and Politics." Single copies are obtainable from the Center, Box 4068, Santa Barbara, Calif. As was widely reported in the press, most of the six authors were critical. The most sweeping indictment of science and scientists was made by Robert M. Hutchins, President of the Fund for the Republic and former President and Chancellor of the University of Chicago. Excerpts from his paper appear below.)

"I wish at the outset to repudiate C. P. Snow, who intimates in one of his books that scientists should be entrusted with the world because they are a little bit better than other people. My view, based on long and painful observations, is that professors are somewhat worse than other people, and that scientists are somewhat worse than other professors. Let me demonstrate that these propositions are self-evidently true.

"The foundation of morality in our society is a desire to protect one's reputation. A professor's reputation depends entirely upon his books and his articles in learned journals. The narrower the field in which a man must tell the truth, the wider is the area in which he is free to lie. This is one of the advantages of specialization. C. P. Snow was right about the morality of the man of science within his profession. There have been very few scientific frauds. This is because a scientist would be a fool to commit a scientific fraud when he can commit frauds every day on his wife, his associates, the president of his university, and the grocer. Administrators, politicians (not campaigning), and butchers are all likely to be more virtuous than professors, not because they want to be, but because they have to be. . . .

"It is clear that the behavior of professors is questionable at best. Scientists are worse than other professors because they have special problems. One of these is that their productive lives often end at thirty-five. I knew an astronomer who was contributing to the international journals at the age of eleven. Compare that with the difficulty of contributing at a similar age to an international journal on, let us say, Greek law. A scientist has a limited education. He labors on the topic of his dissertation, wins the Nobel prize by the time he is thirty-five, and suddenly has nothing to do. He has no general ideas, and while he was pursuing his specialization science has gone past him. He has no alternative but to spend the rest of his life making a nuisance of himself.

"Scientists are the victims of an education and a way of academic life created by their misinterpreters and propagandists. These misinterpreters have propagandized an entirely inconsecutive chain of consecutive propositions: The pursuit of truth, they say, is the collection of facts. Facts can be experimentally verified. Thus, the only method of seeking truth is the scientific method. The only knowledge is scientific knowledge, and anything else is guesswork or superstition. . . .

"The misinterpreters' and propagandists' doctrine has paralyzing educational repercussions. According to its tenets, education consists in cramming the student with facts. There is not enough time to stuff in all the facts. Therefore, facts outside a narrow area of specialization must be excluded. . . .

"Those who live their lives without theory are technicians, or mechanics. As a result there is no significant contemporary social science. Politics is viewed as power because power can be observed and measured. Power is something real. Therefore, using the misinterpreters' logic, it is *all* that is real about politics or political science. . . .

"In spite of the misinterpreters' nonsense, science contains elements of sense. Serious scientists know that science is just one very important way of looking at the world. . . .

"We do not know what science is, and partly as a result we do not know what politics is. Mr. C. P. Snow is wrong about the two cultures. There is only one, and it is pseudo-scientific. . . ."

EDUCATION NOTES

A recent National Science Foundation study shows 2.7 million Americans are now working as scientists, engineers, technicians, or teachers of science and mathematics in secondary schools. Six states—California, Illinois, New Jersey, New York, Ohio, and Pennsylvania—house over half of this number. Approximately 1 out of 4 scientists and 4 out of 5 engineers work for industry. Approximately 1 out of 3

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EDUCATION

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scientists is at a college or university. Most of the remaining scientists work for the government. Dr. Logan Wilson, president of the American Council on Education, said that the educational plant can produce scientists, engineers, and teachers of the quality needed and in the quantities projected, but noted that some smaller colleges are already not making any notable contributions.

On October 10, the House voted approval of its Appropriations Committee's action in cutting the National Science Foundation budget from a requested \$589,000,000 to \$323,000,000. The House also approved the committee's restriction that no new programs be started. The Foundation had requested \$25,000,000 to start a new traineeship program which would have supported beginning graduate students in the engineering, mathematical, and physical sciences. The program was in response to a report from the President's Science Advisory Committee which had recommended large increases in the number of Ph.D.'s granted in these fields. Also killed was a \$33,000,000 new program designed to assist in the development of new "centers of excellence." The Senate is expected to restore part of the cut, with the Foundation finally receiving an allocation somewhere between the two figures. Whatever the Senate action, it is unlikely that the Foundation will be able to do more than initiate one new program, probably in a token manner.

Further action which indicated the concern felt by Congress by the rapidly growing research and development portion of the Federal budget was the creation of a House select committee under Rep. Carl Elliott (D., Ala.) to look into several complex aspects of R and D. The Committee was given \$500,000 for a year-long, comprehensive probe. Since, for example, eleven Federal departments and agencies deal in health and medical research, five deal in space research, seven in oceanography, eight in fresh water research, and fourteen in meteorology. Mr. Elliott's committee has its work cut out for it. Five agencies spend 90 percent of the Federal government's R and D money, with the remaining 10 percent being spent by eight other departments and 24 independent agencies.

The first educational measure to clear the legislative obstacle course was the Health Professions Education Assistance Act (HR 12) which was signed on September 24 and became Public Law 88-129. The \$236,400,000, three-year program provides teaching facilities for physicians, dentists, and others, and for loans for students studying for the health professions.

Dr. Colin M. MacLeod, a microbiologist at the NYU School of Medicine, was appointed as deputy director of the Office of Science and Technology. Dr. MacLeod will be the first life scientist in a high post within the science advisory machinery of the Government. The post of deputy director has been vacant since the Office was created a year ago.

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HARMONY

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sistently opposed safeguard inspections in any part of the world, calling them "spying." Agency officials attributed Moscow's change of attitude to the improved atmosphere in East-West relations that followed the Aug. 5 signing of a treaty on a limited nuclear test ban. (However, at the meeting of the IAEA Board of Governors earlier this summer, the Soviet Union had already reversed its stand and voted to extend IAEA's jurisdiction to larger reactors. See September Newsletter.)

The nuclear test ban pact and the safeguards extension are the only East-West agreements on nuclear questions reached since the end of World War II, one official said. "There has been progress in East-West discussions and it has been reflected here," he said. American spokesmen expressed the hope that the new accord might help the agency attain an important role in preparations for the possibility that inspection will some day be universally accepted. (N.Y. Times, 10/2.)

Prospects are thus currently good for the IAEA (See also Newsletter for September), and Glenn T. Seaborg, Chairman of the U.S. AEC, took note of this when he addressed the conference in Vienna. Seaborg told the delegates that the Agency is now in a particularly favorable position to play an important role in the development of safety standards for world-wide shipments of radioactive material, to assist in setting up prudent international radioactive waste disposal arrangements, to help developing countries make use of radioisotopes, and to explore the desalting of water using nuclear heat. IAEA's future may be considered to be linked to that of atomic power. (W. Post, 10/6.)

ASTRONOMERS WIN CHANNEL 37

The Federal Communications Commission has settled the Channel 37 controversy, at least for a while, by reserving the channel for radio astronomy for a period of ten years. The 3-to-2 decision ended a dispute between scientists and broadcasting interests which began with an application for a commercial TV station in Paterson, N.J., where channel 37 was the only one available. Astronomers at the University of Illinois, whose observatory at Danville, Illinois uses these frequencies, strongly opposed any commercial use of the channel. The FAS filed a formal comment with the FCC, supporting the astronomers' position. (Newsletter, May 1963.)

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