

# News of Science

## Decentralized Science Plan

### Approved by Soviet Academy

Soviet scientific research, until recently rigidly directed by a central agency, will be decentralized to a greater extent in the future. Only a small number of the most important programs, such as those concerned with controlled fusion and space exploration, will remain under strong central control. Planning and administrative authority for most other programs and projects will be transferred to the research institutes that actually do the work. This change, which resulted from the recent annual meeting of the Soviet Academy of Sciences, reflects a major shift in Soviet policy. Previous policy statements of the academy have stressed the need for centralized direction of science.

Behind these changes is the recent adoption by the academy of a new constitution, which is said to be more democratic than the one it replaces, which dates back to 1935. News of the new constitution was made public in a recent issue of *Vestnik*, the official organ of the academy. The new document and the changes it calls for were endorsed by V. A. Kirillin, head of the Communist Party's science division.

In addition to fusion and space activities, high-temperature metallurgical research, advanced computer developments, and certain areas of chemistry will remain under central direction, according to A. N. Nesmeyanov, president of the academy. However, the presidium, the directing body of the academy, which at one time had, in effect, complete authority over planning of the most important scientific projects, will now be joined by other groups in exercising this function. Authority to develop projects other than the 30 or so "high-priority" ones which will be listed in a document titled "Basic Directions of Scientific Research in the U.S.S.R." will be transferred to the various research centers, of which there are about 1000.

## Centralization Attacked

In a news article in *Pravda*, Kirillin combined approval of the new changes with an attack on past practices in Soviet science management. "It would be difficult to imagine," he said, "that any one central institution, even if it had the most qualified people, could study competently and in a short time the vast amount of material that it would receive from all the scientific organizations." The idea that this could be done, he said, should be rejected at once. The proper function of the central institution that until recently had this role—the Academy of Sciences—is pointedly stressed in the new constitution. The academy is "directly subordinate to the Council of Ministers of the U.S.S.R. to which it submits an annual report of its activities." A number of old practices of the academy have been changed or abolished. New members will be elected annually, rather than irregularly as in the past. There will be no more honorary members, and all future members will have to be working scientists. Meetings of the academy's general assembly will have to be held at least twice a year.

### Plan Reverses 1950 Move

The new constitution is apparently designed to give greater autonomy to the many research institutes scattered around the country. It is an attempt, according to some commentators, to achieve actual democratic operation in matters concerned with all but the most critical research programs. The commentators, however, point out that the 1935 constitution was also nominally democratic but that the academy in fact controlled all scientific programs in disregard of the charter. How the new move will succeed is anyone's guess. One point can be made, however. The plan that was revealed by *Vestnik* represents a major and surprising shift in Soviet policy. Just 9 years ago, according to one student of Soviet organization, the trend

was in exactly the opposite direction. The scholar Alexander Vucinich, a research associate at the Hoover Institute at Stanford University, wrote in his study *The Soviet Academy of Sciences*, published in 1956, that "prior to 1950 there was considerable room left for both unplanned research and so-called intrainstitute planning, both of which allowed scholars to participate, at least on a part-time basis, in self-initiated research. Since 1950, an intensive campaign has been under way to eliminate all the areas of independent research and subordinate everything to the plan."

## Satellite Systems Proposed

### To Detect Atom Blasts in Space

Scientists representing the three nuclear powers at Geneva have recommended that one of three satellite systems be used to detect atomic blasts in space. The recommendations, if accepted by the United States, Great Britain, and Russia, would become part of a general treaty for a ban on testing nuclear weapons. Negotiations on such a treaty have been under way since last October.

The new proposals, if accepted, would be the basis for a critical detection net which would be used to assure that there would be no violations of a test ban. Controversy over the feasibility of effective controls has been one of the major stumbling blocks of the long-drawn-out Geneva talks.

Under the proposals, satellites weighing several thousand pounds would be put into orbit to monitor and report on atomic blasts in outer space. Three possible systems were proposed by the Geneva experts. One calls for five or six satellites orbiting at altitudes of more than 18,000 miles. These would be equipped with the necessary instrumentation and would be so distributed as to allow for complete surveillance of the earth. Because of the cost of this system, the scientists offered two alternate systems. One would employ six to ten satellites orbiting at an altitude of about 350 miles. This, according to the experts' report, would allow for complete surveillance with the exception of limited and predictable areas. The third system would employ a smaller number of satellites at about the same altitude as those of the second system, and there would be similar blind areas.

Western sources emphasized that the proposed detection system was com-

pletely feasible in terms of present technology. No new inventions will be needed, but much hard engineering work will have to be done, it was stated.

The United States' scientists were led by Wolfgang K. H. Panofsky, head of the high-energy physics laboratory at Stanford University. The leader of the Soviet group was Yevgeny K. Fedorov of the Soviet Academy of Sciences. Henry Hulme, adviser to the Defense Ministry, was the British leader.

Western observers hailed the completion of the report in less than 3 weeks as a major achievement.

### **Non-nuclear Club Proposal Studied in England**

*A plan for the formation of a "non-nuclear club" of major nations other than the United States and Russia is currently being debated in England. The proposal, that the possession of nuclear weapons be limited to these two countries through voluntary action on the part of club members, has been advanced, in slightly different forms, by the Labor Party and by the editors of the influential Manchester Guardian. According to English commentators, the Labor Party's attitude toward the plan was originally passive. In recent weeks, however, its attitude has changed to one of active advocacy, with leading members of the party, such as Gaitskell and Bevan, taking part in the campaign. One version of the non-nuclear club proposal was discussed in the 25 June issue of the Guardian; the following questions and answers are taken from that discussion.*

#### **What Is Proposed?**

The British are to try to stop the spreading of nuclear weapons to fourth, fifth, and sixth nations and so to the *n*th nation. Our Government should seek an agreement through the United Nations that nobody except the Americans and Russians will make or acquire any nuclear weapons. If such agreement is reached the British must be ready to destroy or hand over their separate weapons.

#### **Why Leave Out the Americans and Russians?**

Because an agreement which lets them keep their weapons will be easier to negotiate. Each of them—quite rightly—regards its bombs and missiles as vital to its security against the other.

Neither will give them up for a long time to come. But other nations apart from the British do not possess nuclear weapons. Therefore they are being asked only to deny themselves something that they have so far done without.

The United States and Russia must, however, support the agreement. They must undertake not to supply weapons to anyone else.

#### **What about Control?**

Control is possible in two ways. The first is to check the use of all fissile materials produced by reactors, which is said to be technically practicable. The second is to find out whether countries are equipping themselves with medium or long-range missiles. Such missiles are one of the principal means of delivering nuclear weapons, and they are too expensive to be worth producing except for use with nuclear warheads. This form of control leaves two loopholes—the chance that the Americans and Russians may secretly supply someone else, contrary to the agreement, and the chance that aircraft rather than missiles may still be used to carry nuclear bombs. There can be no thorough protection against these possibilities. (Nor, of course, is there thorough protection in any other practicable policy.)

#### **What Is Gained?**

Chiefly a reduction in the risk of nuclear war. If the spreading of weapons is not stopped, sooner or later someone will use them. Once anyone uses them a world war is likely (though not certain) to come by a chain reaction. This is because of the premium which to-day's nuclear weapons place on instant action. You must hit back at once or your means of retaliation may be destroyed. Bombers on airfields and missiles on fixed land bases are vulnerable; and if country X (large or small) has reason to suppose that its potential enemy Y is preparing an attack or has launched one, it must get its bombers or missiles into the air at once. (Bombers can be recalled: missiles cannot.) Nuclear weapons to be effective as a deterrent must be constantly ready for firing. Consequently X and Y, even if politically not in a crisis of conflict, militarily must remain tensely alert against each other.

At present, when only three nations manufacture nuclear weapons, it may be possible to prevent their spreading. Once a number of nations have them, international control will be beyond at-

tainment. When a bomb or warhead has been made or stored it can be discovered only by a screwdriver. Further, as a former chief of staff of the I.R.A. (now the Irish Foreign Minister) has said, the weapons of armies to-day become the weapons of revolutionary movements to-morrow.

Small nations, with less to lose than large industrialized nations, may be more ready to risk using their nuclear weapons. And, the more widely these weapons are distributed, the greater the risk that they will come under the control of unstable governments or impetuous officers.

#### **Can It Help towards Comprehensive Disarmament?**

Yes. You have to have a starting point, which may be with ending tests, or with a form of disengagement in Europe, or with stopping the spread of nuclear weapons—or with all three. The Americans and Russians are unlikely at present to allow thorough inspection of their factories or bases, so there is value in a control system which can be demonstrated in practice first on the territory of other nations. To say that it should not be accepted until there is general agreement on comprehensive disarmament is like saying that the United Nations should not have been accepted because it was less than an effective world government. The non-nuclear club can be one of the stages on the road to greater disarmament.

#### **What about the French?**

The French Government is now so fully committed to making its own bombs that it cannot stop or be stopped. It can, however, be asked to join the British after it has proved its bomb-making ability. It can be asked to sponsor the non-nuclear club jointly with the British. Will it do so? Not if President de Gaulle is immovably convinced that Western Europe must build a deterrent force of its own, so that it can stand apart from the Americans. But if he is chiefly concerned with securing equality of status with the British, his point can be met.

#### **And the Chinese?**

The Chinese may be brought into the non-nuclear club as part of an agreement to admit them to the United Nations. Alternatively, if they insist on parity with the Americans and Russians