Science in the News

Disarmament and the Test Ban: Several New Developments Merely Confirm That the Outlook Is Dim

Last week disarmament was in the news a good deal, but none of the news offered any hope for progress in the near future.

The President announced at his press conference that he had asked his Science Advisory Committee to set up a panel to report on the technical side of the test-ban problem: specifically, on how much chance there was of the Russians' carrying out testing without our getting any evidence that it was taking place; how much progress they might be making by conducting the kinds of tests that can be thoroughly concealed; how significant this progress might be in altering the power balance between Russia and the West; and how much we ourselves could expect to gain from a fairly prompt resumption of testing, considering, of course, that the Russians also would restart open testing as soon as we did.

At the same time the Soviet-American discussions aimed at working out the format for general disarmament negotiations continued, although there were good indications that no progress was being made.

Finally, Kennedy carried out a Democratic campaign pledge by sending to Congress draft legislation setting up a major agency devoted to disarmament and related problems.

Scientific Panel

The announcement of the creation of a scientific panel to report on the test ban must be regarded as primarily a public gesture. The Administration would have been grievously negligent if a panel for just this purpose were not already in existence, continually evaluating whatever new information is coming in affecting the calculation of the risks involved in continuing the current unpoliced moratorium; in particular, a detailed review of this sort certainly was made sometime between the turn of the year and late March to provide the basis for the Administration's policy commitments made when the Geneva talks were resumed on 21 March. Politically, the situation has changed drastically since then: the Russians, as demonstrated, for example, by their insistence on a veto over inspections, have obviously lost interest in reaching an agreement; but technically there has been no hint that the situation has changed significantly, and therefore there is no reason to believe that the report of the new panel will be significantly different from the report that must have been made earlier in the year.

Neutron Bomb

There has been a good deal of talk lately, of course, about the neutron bomb, but this represents not a new technical factor in the calculation of risks, but a talking point for those who favor a fairly prompt resumption of testing. (Except for those who have been against the test-ban talks all along, such as Senator Dodd, no one seems to be very specific about just how promptly testing should be resumed.)

Although the term *neutron bomb* was not used, and the specific characteristics of the weapon were only vaguely described, an article in *Fortune* a year ago, giving the case for resumption of testing, was apparently based largely on the neutron bomb. The same is true of an article in *Foreign Affairs* of the same period. Both articles stressed the possibilities of a hydrogen (fusion) weapon which would not require a uranium (fission) device to trigger the reaction. The recent flurry of leaks about the neutron bomb have described this weapon in these same terms. The weapon would be triggered by a chemical reaction. The distinguishing feature of this pure-fusion weapon (other types may be theoretically possible, but they have not been publicly discussed) is that it would be comparatively cheap, and compact, and that it would produce comparatively little blast effect. Instead, it would produce an intense flux of high-speed neutrons, capable of destroying all life in the target area, while producing little damage to nonorganic matter. But the target area involved would be small compared with that of "conventional" hydrogen weapons. It would apparently be a tactical battlefield weapon, not a city-destroying strategic weapon. There is disagreement among the scientists involved over the specific characteristics that could be built into the weapon—that is, over how large the effective target area might be and over the speed with which the weapon might be developed.

Most of the news leaks that have produced the recent stories about the weapon have come from Congressional supporters of test resumption: that is, from men who do not have the technical backgrounds to inspire unquestioned confidence in their evaluation of the possibilities of the weapon. Apparently the weapon is about 5 years off, in any case, and no case has been made that a decision to devote a major effort to developing the weapon would be restricted by a continuation of the unpoliced test-ban for, say, another year. Thus supporters of a resumption of testing have seized on the neutron bomb as a dramatic talking point.

But all the talk offers little guidance for the general public in trying to understand the precise basis for whatever decision will be made, a situation which seems unavoidable since the technical arguments are highly sophisticated, and since a good deal of the most essential information on weapon development must necessarily be kept secret. That the Congressional leaks on the neutron bomb do not add up to a case for the fairly prompt resumption of testing does not mean, of course, that such a case cannot be made and that the case will not prove convincing to the Administration.

Political Questions

On the nontechnical side, the great question that troubles the decision-makers, of course, is in evaluating the harm that will be done if testing is resumed. One view is that if this country resumes testing underground, the Russians will probably resume testing in the atmosphere, and since the American tests would produce no fallout and

the Russian tests would, we would come off better than the Russians. But the world-wide concern over fallout is based not only on calculations of the damage it might cause, which after all is fairly small, but in large part on the revulsion against the development of more horrible nuclear weapons, of which the fallout danger is a by-product. To the extent this is true it does not follow that the world reaction against a possible Soviet resumption of fallout-producing tests would be greater than the reaction against the United States for being the first to resume testing at all, even though the U.S. tests produce no fallout. But no matter how awkward a resumption of testing may be, it remains true, as Administration officials have privately emphasized, that the decision cannot be avoided if it becomes clear that the risks of continuing the voluntary ban while the Russians may be secretly testing simply cannot be accepted.

It is in this connection that the public announcement of the organization of the scientific panel is significant, and it is a safe assumption that the review will be followed by a public report by the panel evaluating the risks of continuing the unpoliced moratorium indefinitely: in other words, the organization of the scientific panel, like the issuance of the White Paper (*Science*, 23 June) last month must be viewed primarily as a move intended to promote general understanding of the reasons for American policies in preparation for a possible resumption of testing, although the White Paper, ostensibly, was a diplomatic note to the Russians and the scientific panel is being set up, ostensibly, to produce an evaluation for the Administration. This does not necessarily mean that a decision to resume testing has yet been taken; it simply reflects the fact everyone now recognizes that there is no likelihood that the Russians are going to agree to a policed test ban in the near future, and therefore that the United States has no choice but to prepare the ground for a resumption of testing if that should prove necessary. Even if testing is not resumed, such steps as the issuing of the White Paper and the convening of the scientific panel would still be extremely useful in making clear to the world why, in our view, the Russians are clearly to blame for the collapse of hopes for reaching a formal agreement.

On the Soviet-American talks aimed at setting up the framework for the general disarmament negotiation which had been scheduled to begin 31 July, both sides promised to keep the exchanges entirely private. Although John J. McCloy, the American representative, refused, for this reason, to discuss this topic with reporters, no one who had talked with him could avoid the impression that very little progress was being made. The first phase of the negotiations ended last week. McCloy arranged for Valerian Zorin, the Soviet negotiator, to pay a call on the President, and it was announced that the negotiations would be broken off for 2 weeks, to resume in Moscow on 17 July.

Disarmament Agency

The Administration, nevertheless, followed through on its campaign commitment to organize a much-expanded Disarmament Agency. A high Administration official said that the outlook for disarmament is not very bright at the moment but "it's just as important to patch the roof when it's raining as when the sun is shining."

The draft legislation was a long way from the elaborate proposal for a Peace Agency put forth last year by the Democratic Science Advisory Committee. That agency would have pretty much taken over all research related to the world's economic and social problems, as well as its more obvious work on disarmament. The new agency, though, will still have broad research responsibilities, going beyond a narrow definition of disarmament, and, in addition, major operating functions: specifically, carrying on actual negotiations and running the control organization if and when a control agreement is signed.

The new agency will be authorized to sponsor research not only on problems directly involving disarmament and arms control, but in such matters as economic impact of disarmament and the problem of gradually developing a system of international law to provide for peaceful settlement of disputes.

A good deal of this could have been set up simply by making vigorous use of the present Disarmament Agency, which was organized last fall on the basis of a Presidential executive order. But the Administration chose to ask Congress to provide formal legislation, in part to emphasize the importance it attaches to the agency, in part to ease the way for getting appropriations for the agency through Congress.—H.M.

Salk, Sabin, and the AMA

The American Medical Association has endorsed the mass use of the Sabin oral vaccine against polio, stating that the Salk vaccine, the only one thus far licensed for use here, cannot eradicate polio in the United States. The AMA implied that the oral vaccine, still undergoing tests for safety and potency, should be given, when available, to everyone, even those who have received the full Salk series of three injections and booster.

Jonas Salk protested the implication that the oral vaccine should be given to everyone, including those who have received the Salk series, and termed the AMA endorsement "questionable and of doubtful practicality."

The AMA approval of the Sabin vaccine is the first ever given by the organization to an unlicensed product still being tested. The licensing by the Public Health Service has been delayed by uncertainties about (i) the interaction of the live poliovirus with other viruses in the intestinal tract; (ii) the possible effect of the virus on the central nervous system; and (iii) the dosage schedule for maximum effect. In addition, the PHS requires that five consecutive lots of the virus vaccines, all free of extraneous viruses or other matter, must be produced to assure continuous safety of all lots. The vaccine is produced in monkey tissue which not infrequently demonstrates the presence of other viruses, but manufacturers expect to be able to satisfy this requirement by fall.

The spread of polio in the United States has been markedly reduced by the use of the Salk vaccine. But the method of administration by injection, requiring trained personnel, as well as the time involved in getting the number of shots necessary to build up immunity, has had some limiting effect on the number of people benefiting from it. However, a significant advantage of the Salk vaccine is that it does not reintroduce live poliovirus into the population.

The oral or live-virus vaccine such as the Sabin product has been used with success in the Soviet Union, Great Britain, and in South America. The oral vaccine has been given by teaspoon in a cherry-flavored syrup. Ease in administration has meant wider and faster distribution than can be provided for Salk vaccine. The oral vac-