News and Comment

Test Ban: Illusion of Progress Had Arisen from Rush of Proposals but Basic Issue Remained Untouched

Geneva, Switzerland. The 18-nation disarmament conference recessed here last week with the long-sought nuclear test ban still out of reach. The outcome dashes hopes that had risen unusually high. The impression had been growing that at long last things were moving along.

The nonaligned nations at the conference had advised East and West—somewhat in the manner of good friends unhappily observing a family fight—that they were closer to agreement than they thought they were. The United States and the Soviet Union had furthered this impression by asserting that just a bit of give on the other side would bring the long-sought-for test ban to hand, and Acting United Nations Secretary General U Thant had concluded that things had reached the point where only "hair-splitting" was preventing agreement. Unfortunately, a close examination of the negotiations and the domestic political realities, East and West, that govern them puts a heavy burden of proof on those who would justify such optimistic conclusions. Informal appraisals at the conference of just how much freedom Kennedy and Khrushchev have to deliver that final bit suggest that is it not likely to be forthcoming anytime soon.

While formal discussions at the conference had centered on the verification and significance of underground testing, there had been a remarkable amount of informal talk about the minimum treaty Kennedy could sell to the Senate and the minimum that Khrushchev could get accepted by the powers with which he must contend. Thus, in private conversations, members of the Soviet delegation had said that the problem of arriving at a test-ban agreement was "political" and not "technical," and this may account for the U.S.S.R.'s adamant refusal to bring scientists here to support its rejection of the seismic data presented by the United States. Hints have arisen from the Soviet and Eastern bloc delegations—but admittedly no more than hints—that, since Khrushchev's prestige was badly singed by the U-2 incident, he is in no position to open the motherland to mandatory inspection, no matter how carefully circumscribed the inspections may be or how neutral the inspectors. At the same time, members of the American delegation, when pressed for an indication of how far the United States is willing to go to assuage the Soviet phobia about foreign inspection, have said that with existing detection techniques the right for foreign inspectors to go into the Soviet Union would be the minimum price for getting a test-ban treaty safely through the Senate. They point out, and consider it ominous though still of uncertain significance, that proposals unacceptable to the Russians have been denounced as too compromising by Republican leaders.

Scaled-Down Demands on Inspection

Just how many inspections were involved in the United States proposals and under what circumstances the inspections would be made are matters that were not explored in detail, since the Soviets refused to discuss the minutiae of a principle they refused to accept. But the United States made it clear that it is willing to scale down the inspection procedure to a point where it will be more significant as a principle than as a process for determining whether the Soviets are adhering to an underground test agreement. This emphasis on principle, rather than substance, is perhaps best seen in the United States' willingness to accept an uninspected ban on above-ground testing, although it is conceded that it would be possible to conduct nuclear tests deep in space with relatively little chance of getting caught. Testing in space is a costly and possibly unreliable process, but if the worst fears about Soviet intentions and motives are borne out, the U.S.S.R. would be going into a test ban with a determination to appear to be a good world citizen while reaping the benefits of clandestine development of nuclear weapons. Testing in space would thus appear to be a possibility which the United States would not leave to the Soviet's good faith; nevertheless, because an inspection system that could deter space tests would have to involve what is not even worth attempting to discuss with the Soviets—visits to their missile bases to check payloads—the issue of verifying a ban on nuclear testing in space was not even brought up.

The impression of sudden progress at the talks had been created by a series of fairly rapid proposals, counter-proposals, and purported clarifications of positions, but fundamentally at issue there remained the question of obligatory inspection, and on this both sides contended that they had arrived at their rock-bottom position. The United States, for its part, has concluded on the basis of data from its far-reaching seismic study, Project Vela, that it would be willing to have seismic detection stations in the Soviet Union staffed by Russian personnel under a still vaguely formulated system of "international supervision." It has also said that with the improved detection techniques developed through Vela, the number of unexplained earth disturbances in the Soviet Union would be reduced to a point where the previous demand for from 12 to 20 inspections annually could be lowered considerably; just how many inspections would be specified has not been said, but it has been suggested that the maximum would probably be no more than ten. And, finally, the United States has quietly backed away from its previous insistence that the inspection teams going into the Soviet Union contain at least some American personnel. Under the American proposal the decision on the makeup of the teams would rest with an executive officer chosen by a commission representing East and West but numerically dominated by nations jointly selected by the nuclear powers. Thus, the American proposal formally accepted the possibility that no Americans, or even representatives of the West, would participate in investigating possible

underground tests in the Soviet Union.

The Soviets, meanwhile presented an appearance of motion on the issue of inspection, but just what the motion meant is open to widely varying interpretations. The United States and Britain contend that it meant nothing, while a number of the nonaligned nations, including Sweden and India, concluded that the Soviets had, in effect, accepted the principle of obligatory inspection but, for domestic reasons, did not want it conspicuously hung around their necks.

The basis for conflicting interpretations of the Soviet position was a long statement delivered several weeks ago by the Soviet delegate, Vasily V. Kuznetsov, in what he described as an attempt to clarify the situation. Without any doubt, he said in the usual vein, the West is insisting on inspection because it is a useful device for espionage; further, he said, inspection is not needed because seismic devices tell the whole story (he did not, however, choose to be specific on this issue or to accept the standing U.S. invitation for Soviet scientists to present evidence at variance with the Vela findings. One reason for this Soviet reluctance may be that the U.S. has presumably gone into the study of underground detection more extensively than any other nation and has data to disprove any easy assumptions. It has announced that "more than 40" underground explosions were studied by Vela, and a disputant who contends that all underground tests above a certain range are detectable and distinguishable from natural phenomena would be required, at the minimum, to state just how many more than 40.

Kuznetsov went on to say that, regardless of the espionage motives and the lack of need for inspection, the Soviet Union was committed to the principle of a controlled test ban. While it would not accept an obligation to be inspected, it would agree to inspection by "invitation" on the "concrete facts of the situation." Since world opinion would not tolerate a refusal to cooperate with the inspection commission, he explained, "can one conclude that the nuclear powers will always adopt a negative attitude on inviting a commission to visit their territory? Of course, this cannot be done. It would not be justified. Every government concerned, in every concrete case, will weigh carefully all the facts of the situation. Therefore," he continued, "it appears that the formula of an on-site inspection upon invitation, without bringing to it the concept of an obligatory on-site inspection, does not preclude the possibility of on-site inspection in concrete cases."

And there the matter stands, with the Soviets declaring that out of respect for peace and world opinion they will cooperate—but still refusing to accept an obligation to cooperate; meanwhile the United States insists that it is willing to make inspection as painless as possible, but the Soviets must accept it as an obligation. (Arthur H. Dean, the U.S. delegate, told the Soviets, for example, that the inspectors could travel in a curtained plane, manned by a Soviet crew, and that they would be limited to investigating a relatively small area in the vicinity of the unexplained earth disturbance. Under these conditions, the Soviets have been repeatedly asked, how can inspection be equated with espionage? The Soviets insist, nevertheless, that the two are one and the same.

The impression of progress over the past few weeks has arisen from a fairly rapid exchange of proposals and responses, which attest more to quick staff work and good communication between Geneva and Washington and Geneva and Moscow than to any alteration in position on the fundamental issue of obligatory inspection. In one session, for example, the United States offered two treaties: (i) a comprehensive test ban—underground, underwater, atmospheric, and in space —with the proviso that obligatory inspection would be required for the underground ban (the other areas of testing can supposedly be checked from points outside the Soviet Union); (ii) a treaty which would require no inspection but which would apply only to underwater, atmospheric, and space tests with the parties free to test underground but expected to show "restraint." The Soviets rejected both offers within 24 hours and countered with a proposal for an uninspected moratorium on all tests, which the United States promptly rejected, recalling that the Soviets broke an informal moratorium when they resumed testing last fall. The Soviets then took up a Mexican suggestion that it would be nice to end all testing by 31 January, a proposal to which the United States fully agreed, thus furthering the illusion of agreement just around the corner without anything having been accomplished toward resolving the inspection issue.

Persons charged with divining Soviet motives conclude that the Russians see no hazard to themselves in an uninspected moratorium since it would be virtually impossible for the United States to go very far in a clandestine underground test series without word leaking out and ultimately reaching the press. This may seem to be a rather naive view of the U.S. Government's ability to carry on covert operations, but the facts are that too many people would be involved in underground testing and opposition in the United States to continued testing is too strong for any breach of a moratorium to remain secret very long. The Soviet rejection of an agreement that would still permit underground testing is regarded to be an acknowledgment that the Soviets consider the United States to be ahead in this method of weapons development and do not wish to restrict themselves if the competition is to continue. Implicit in the U.S. insistence on obligatory inspection for underground tests is the assumption that the West cannot be certain of what the Soviets have been doing underground. Nevertheless, it is generally assumed that they have not been doing very much. The United States has reported, and the Soviets have acknowledged, one underground test inside Russia. Thus, the Soviets have openly charged that a treaty sanctioning underground tests would, in effect, be to the advantage of the United States—something American officials do not deny.

A Propaganda Forum

The official purpose of the disarmament conference was, of course, to work out an arms agreement with the Soviets, but the most important function of the conference proved to be that of a propaganda forum for the principal parties. (A statement published by the Arms Control and Disarmament Agency pointed out that "even if no agreement is reached in the near future, the conference offers useful opportunities to advance United States interests by communicating our point of view to other nations, by demonstrating that disarmament is a complicated task which cannot be achieved by sweeping propaganda proposals. . . .") On the American side, evaluations were quite optimistic on how well the U.S. is doing in getting across its view. "I think," said one

American official, "that we've got the Russians boxed in and we've convinced the neutrals that the Russians just don't want a test ban. Except for the Indians," he added; "they come to their own conclusions and there's no use in trying to figure out how." This favorable appraisal tended to lose some of its shine in conversations with members of the neutral delegations. Views varied within each delegation and between delegations, but it appears from an admittedly incomplete survey that a number of the neutrals feel the United States is going to have to go a good deal closer to the Soviet position if a test ban is to be achieved. One line of comment reflects the feeling that the United States must recognize that it is dealing with a very difficult and disturbed adversary and therefore must be cautious, but nevertheless conciliatory and conscious of the adversary's painful states of mind. When the neutrals are asked whether it is unreasonable for the United States to insist that the Soviets agree to obligatory inspection, they reply that, after all, the Soviets have in effect agreed to it and more should not be expected of them. When it is pointed out that the Kennedy Administration could not hope to obtain Senate approval for a treaty that does not include obligatory inspection, the reply is to the effect that American politics *are* difficult but that Kennedy has more maneuvering room than Khrushchev. "The fact is," said a member of one neutral delegation, "that you fellows are going to blow up the world while you're bickering over petty matters."

With no shifts in position forthcoming on the inspection issue, the inevitable question, What next?, seems to have only one answer; a continuation and possible acceleration of the arms race, very likely into the realm of outer space, where, the belief is growing, the Soviets are now directing considerable effort. It has been argued that the arms race has reached a point where, on balance, an uninspected moratorium would be in the interest of the United States, since an uninspected moratorium would make it at least very difficult to develop nuclear weapons for space. The idea is not without adherents within the Administration, but the dominant view is that, while the arms race is perilous, it would be even more perilous if the first step toward arms control were not accompanied by a requirement that the Soviets stand ready to prove that they are living up to the agreement.—D. S. GREENBERG

Announcements

The European Nuclear Energy Association, a branch of the 18-nation Organization for Economic Cooperation and Development, has formed a **European-American Committee on Reactor Physics** to promote the coordination of reactor physics research and the exchange of reactor physicists and experimental reactor materials. The committee, chaired by Bernard I. Spinrad, director of the Argonne National Laboratory's reactor engineering division, will periodically review reactor physics projects under way in sponsoring countries and arrange meetings and disseminate their results. A clearinghouse for information on heavy-water reactors will be established at the U.S. Atomic Energy Commission's Savannah River Plant, Aiken, S.C., to keep sponsoring countries up to date on experiments. The next meeting of the committee, to be held in Zurich, Switzerland, has been tentatively set for February 1963. (Bernard I. Spinrad, Reactor Engineering Div., Argonne National Laboratory, 9700 S. Cass Ave., Argonne, Ill.)

Polish-speaking medical professionals are being sought to staff a medical exhibition which will be displayed in several Polish cities during the months of January and February 1963. An orientation session will be held in Washington, D.C., during December of this year. Physicians, medical researchers, and technologists are needed who can converse with professional and lay audiences on the subject matter of the exhibits. (John W. Auer, Employment Branch, U.S. Information Agency, Washington 25, D.C.)

Meeting Notes

The National Academy of Sciences has compiled a list of noninternational meetings to be held in the **Soviet Union and Eastern Europe**, to assist persons interested in scientific activities of those countries. The list, to be revised and published quarterly in the "Forthcoming events" section of *Science*, appears on page 870.

Scientists who are planning professional visits to these areas are invited to use reference material gathered by the Academy's Office of the Foreign Secretary. Copies of reports by American scientists on their visits to the Soviet Union, and similar data on other Eastern European countries, are available free of charge. Requests should include a description of the exact field of interest so that relevant information may be prepared. Inquirers desiring additional information will be referred to persons familiar with the U.S.S.R. and Eastern Europe. (Office of the Foreign Secretary, NAS, 2101 Constitution Ave., Washington 25, D.C.)

A conference on the **conceptual bases of the communication sciences**, intended for both mathematicians and biologists, will be held in Los Angeles on 13 and 14 October. Since the number of participants will be limited, admission will be by ticket only. (Pearl Fles, c/o Mary A. B. Brazier, Brain Research Institute, University of California, Los Angeles 24)

Grants, Fellowships, and Awards

The U.S. Atomic Energy Commission is inviting proposals for the design, construction, and operation of **all-nuclear power plants** to be powered by water-cooled and moderated reactors capable of producing at least 400,000 gross kilowatts of electricity. Financial assistance, up to a maximum dollar amount, will be available toward the research and development costs related to the supply system, and the costs of nuclear-facility and architect-engineer designs for the plant. The results of such research and development, and the designs, will be owned by the AEC. The proposer must provide a suitable site, bear all other related costs, and operate the plant for 5 years after initial criticality.

Proposals may be submitted by investor-, cooperatively-, and consumer-owned electric utilities and nuclear-power-plant manufacturer and designers in the U.S., its territories, Puerto Rico, and the Canal Zone. Deadline for receipt of proposals: *3 December*. (R. J. Hart, Division of Contracts, AEC, Washington 25, D.C.)

Nominees are being solicited for the 1963 **high-polymer physics** prize of the American Physical Society. The $1000 award, sponsored by the Ford Motor Company, is for "outstanding accomplishment and excellence of contributions in high-polymer physics." Deadline for receipt of nominations: *1 November*. (Julian H. Gibbs, Metcalf Chemistry Laboratory, Brown University, Providence 12, R.I.)