PART III

THE PATH TO THE MOSCOW TREATY
The Negotiations Resume

I

The Context: Elements of Change and Continuity

Formal negotiations on a nuclear test ban treaty resumed on March 14, 1962, with the opening session of the newly constituted Eighteen-Nation Disarmament Committee, under conditions which were somewhat different from those which had prevailed during the closing days of the Conference on the Discontinuance of Nuclear Weapon Tests. Some of the changes were the result of events which occurred in the month and a half following January 29, the date of the last meeting of the Geneva Conference. Others stemmed from longer-range developments which either were beginning to come to fruition or were perceived during this period.

The Shifting Military Balance: Toward Increased U.S. Power

One of the most important longer-run developments which inevitably would have an effect on the nuclear test ban negotiations was the shifting pattern of military power. Shortly after he became President, John F. Kennedy requested a reappraisal of the entire defense strategy, capacity, commitments, and needs of the United States. On the basis of this reappraisal, and in response to a deteriorating world situation, especially in Southeast Asia, and to a developing crisis over Berlin, on three separate occasions during the spring and summer of 1961, March 28, May 25, and July 25, President Kennedy requested additional appropriations for military purposes. As a result, in August 1961 Congress finally passed a defense appropriation bill totaling $46,662,550,000, a figure which exceeded the original request prepared by the Eisenhower Administration by more than $3,750,000,000. The additional funds, plus certain savings, were allocated both to increasing the United States’ strategic power
and to enlarging its capacity to deal with limited and guerrilla wars. In addition, in the summer of 1961, in connection with the Berlin crisis, Congress authorized the President to mobilize 250,000 reservists, and the first troops called up under this authority reported for active duty on October 1, 1961. By the end of 1961 the effects of these measures had begun to be felt and the trend of developments was clear. The defense appropriation for fiscal year 1963 was even greater, $48,136,247,000.

In the two years from the end of 1961 to the end of 1963 the United States would double the number of nuclear warheads in its strategic alert forces, and more than double their total megatonnage. The number of American operational long-range missiles would jump from forty-five to five hundred. The United States would increase its combat-ready Army divisions by about forty-five percent, from eleven to sixteen; the number of its tactical air squadrons by thirty percent; and its airlift capacity by seventy-five percent. Ship construction and conversion to modernize the fleet would be doubled.¹

Of course these moves to increase United States power did not pass unnoticed by the USSR. On July 9, 1961, Chairman Khrushchev announced that the Soviet Defense Ministry had been instructed temporarily to suspend the reduction of the armed forces planned for 1961, and that the Soviet Government had decided to increase defense spending in 1961 by 3,144,000,000 rubles, making the total 12,399,000,000. The arms race had been stepped up considerably, and the USSR was determined to create the impression that it would match or surpass the United States’ military build-up. However, when the test ban negotiations resumed in March 1962 it was far from certain whether or not the Soviet Union could maintain the pace set by the United States. By that time it was apparent that instead of the USSR’s having many more operational missiles than

the United States, as several in the West had predicted and feared, the balance was about even. By the end of 1963 the USSR would have only about one-fifth as many long-range missiles as the United States, and only about half as many long-range bombers. The USSR would have quantitative superiority vis-à-vis the United States only in intermediate and medium-range ballistic missiles and in ground forces. Moreover, the USSR's margin of superiority would disappear if the comparison were broadened to include all NATO forces on one side and all Warsaw Pact forces on the other. The ground forces of NATO would total 3,200,000, while those of the Warsaw Pact would total only 3,000,000. NATO would have more ground forces in Central Europe than the Warsaw Pact.

The test ban negotiations would resume then in the midst of a quickening arms race from which the United States would emerge within a relatively short time with an unquestioned net military superiority, although each side would still be able to wreck horrendous damage on the other.

Exactly how this change in the distribution of military power would affect the test ban negotiations could not be foretold. Some American policy-makers predicted a favorable impact. They argued that since the USSR respected strength, the increased American military power should result in increased Soviet propensity to make concessions. They also argued that the Soviet Union would feel the costs of a spiraling arms race more than the United States, and therefore would be more desirous of ending such a race and thus more interested in a nuclear test ban. Other policy-makers, among them Jerome B. Wiesner, maintained that the American military build-up would have exactly the opposite effect, that it would make the USSR more intransigent and decrease the chances of obtaining a nuclear test ban.

The Results of the USSR’s 1961 Tests: Superiority in High-Yield Weapons

A second element in the changing context was the new situation with respect to the development of nuclear weapons, resulting from the USSR’s surprise abrogation in August 1961 of the nearly three-year-old moratorium on nuclear testing. The test series which the USSR began then was elaborate and extensive. Approximately fifty tests were conducted within three months. Some of these apparently
related to the development of an anti-intercontinental ballistic missile. On October 30, 1961, the USSR tested a 58 megaton bomb, the largest weapon ever detonated. Furthermore, had the fusion material comprising the core of the weapon been encased in a uranium rather than a lead jacket, it is estimated that its yield would have been 100 megatons or more. Several of the other Soviet tests had yields of more than 10 megatons. As a result of these tests, the USSR became technically more advanced than the United States in the high-yield range. The Soviet Union's superior position related both to the construction of such weapons and to understanding their effects.

The largest weapon which the United States had ever tested was the 1954 15 megaton Bravo shot. General Curtis E. LeMay, as Commander in Chief of the United States Strategic Air Command, and the Air Force had recommended in that same year that the United States should develop a 50 to 100 megaton yield weapon, but this recommendation had not been accepted. The Eisenhower Administration consciously chose not to pursue this development because it felt that there was no military requirement for such high-yield weapons.

As in the past, the results of the Soviet test series were evaluated by several United States governmental groups, including a panel of scientists headed by Hans A. Bethe. In a statement published in September 1962, Professor Bethe asserted that the kinds of weapons which the USSR tested showed "that their laboratories had probably been working full speed during the whole moratorium on the assumption that tests would at some time be resumed," and that "it is very likely that they started specific preparations by March 1961 when the test ban conference reconvened in Geneva."² As early as January 5, 1962, Professor Bethe stated in a public lecture in Ithaca, that in his opinion a test ban as such was "no longer a desirable goal to pursue."³ Although he was not concerned about high-yield weapons and the effects of the USSR's superiority in this area, he felt that the United States should test those designs which

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had been developed in its laboratories and which fitted its strategic needs. On the other hand, he also thought that both sides had relatively little more to learn about nuclear weapons.

In public at least, Professor Bethe did not say, as he very well could have, that what he had predicted might happen had in fact occurred. In 1958, in arguing for test ban negotiations, he had warned that the only result of continued testing of nuclear weapons would be to diminish the American superiority over the USSR in this category of military technology.

Again, the effects of this new situation on the nuclear test ban negotiations could not be foretold. Since the USSR now held a definite lead in certain areas of nuclear weapons development, one might have expected that it would try to freeze the situation to preserve this lead, following the course which Professor Bethe had urged for the United States in 1958. Conversely, one might have expected that the United States would seek to recoup its lead, to redress the balance, or to minimize the gap between its stage of development and that of the USSR.

The Debate Within the United States: To Test or Not to Test in the Atmosphere

Indeed, the most pressing issue posed by the Soviet test series for the United States was whether or not it should resume atmospheric testing. When President Kennedy ordered the resumption of nuclear tests on September 5, 1961, he confined his authorization to tests which could be conducted in the laboratory and underground. Actually, this was all that the United States was prepared to do. The grounds at Eniwetok and Bikini had been allowed to run down, and in view of their location within the Trust Territory of the Pacific Islands, there was some question about the political wisdom of using them again. Certainly there would be an outcry in the United Nations if they were used. There appears to have been little preparation in the United States' weapons laboratories during the moratorium for resumed atmospheric testing. Moreover, the skills and morale of the laboratories appear to have deteriorated to some extent during this period. 4 Even with respect to underground testing, which had

4See the testimony of Dr. John Foster, Jr., Director of the Lawrence Radiation Laboratory, University of California, Livermore, California, and of Dr. Norris E. Bradbury, Director, Los Alamos Scientific Laboratory:
been regarded as a more likely contingency during the moratorium, American preparations were not extensive. For example, very few holes had been prepared. As a consequence of all of these factors, the United States conducted only nine underground nuclear explosions in 1961.

Pressure for the United States to engage in an extensive test series and to test in the atmosphere began to mount immediately after the Soviet Union broke the moratorium, and it increased in intensity as the extensive nature of the Soviet test series became apparent. As early as November 2, 1961, President Kennedy announced that preparations would be made for atmospheric tests so that they could be undertaken should it be deemed necessary. And in the late fall of 1961 a special task force was formed under the command of Major General Alfred D. Starbird to prepare for tests in the atmosphere and at high altitudes, and $80,000,000 was allocated for this purpose. Ultimately the task force would include 11,800 individuals. However, President Kennedy made it clear to the Pentagon that these preparations did not commit him actually to conduct a testing program.

The President and Prime Minister Macmillan discussed these matters at their meeting in Bermuda in late December. British concurrence with an American decision to resume atmospheric testing would be helpful, and if the United States could use the facilities at Christmas Island, a British possession in the Pacific, as well perhaps as those at Johnston Island, an American possession, it would obviate the necessity of again testing in the United States Trust Territory. Macmillan made an eloquent plea for one more effort to break the cycle of tests and counter-tests. He had a deep horror

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*6a* See the account of the Bermuda meeting in Arthur M. Schlesinger, Jr., *A Thousand Days*, pp. 489-90.
of nuclear war and was determined to press for a test ban. He had thought that a treaty could have been achieved in 1960 and was sharply disappointed that it had not been. He had told Kennedy that the failure "was all the fault of the American 'big hole' obsession and the consequent insistence on a wantonly large number of on-site inspections." Eventually though, the Prime Minister seemed to agree that if the situation did not change he would recommend to the Cabinet that permission be given for the United States to utilize the facilities at Christmas Island. On December 22, 1961 the two leaders issued a communique which paralleled Kennedy's announcement of November 2.

President Kennedy did not announce a final decision to resume atmospheric testing until March 2, 1962. Meanwhile, a bitter debate raged within the American Administration, and the British continued to play a role in this debate, via letters to the President from Macmillan and other means. The debate concerned not only whether or not to resume atmospheric testing, but also, if such a decision were taken, the number and yield of the weapons to be tested. The division within the government paralleled many of those which had previously existed concerning issues involving the nuclear ban negotiations. Those opposed to the resumption of testing included Dr. Jerome B. Wiesner, Special Assistant to the President for Science and Technology; Adlai E. Stevenson, chief United States delegate to the United Nations; the Department of State; and the United States Information Agency. The Joint Chiefs of Staff favored the resumption of testing. As early as October, they had called for a resumption of atmospheric testing in November. The Department of Defense took a similar position. It was Secretary McNamara who had asked the President to authorize development and effect tests in the atmosphere. Still, at a lunch with Secretary Rusk and McGeorge Bundy shortly before the actual tests began, he suggested "that they were not really necessary." The Atomic Energy Commission argued for atmospheric testing, but it felt that there should be limitations on the types of tests. Several powerful members of the Joint Committee on Atomic Energy also favored the resumption of atmospheric testing. As

6bIbid., p. 452.
in the past, this intra-governmental argument both spilled over into and reflected a similar debate within the public arena. And also as in the past, the American scientific community was deeply divided.

Those favoring the resumption of atmospheric testing argued that such action was necessary because of the advances which the Soviet Union had made. Starting from this common ground the argumentation advanced by those on this side differed with the sophistication, background, and interests of the advocate. Perhaps Edward Teller developed the most elaborate rationale. He set forth his views in a book, *The Legacy of Hiroshima*, which was published on March 2, 1962. Excerpts from this book were published as three serial articles in the *Saturday Evening Post*, starting February 3, 1962. Professor Teller argued that the problem of radioactive fallout "was not worth worrying about," and that because of the difficulty of policing underground tests, a nuclear test ban was a chimera. He maintained that further nuclear experiments were essential to United States's security in several ways. The most important reason, he felt, was so that the weight of nuclear warheads could be reduced in order to make the total weapons system more mobile and effective. This was necessary, in his view, to insure that the American retaliatory force could survive an enemy attack. In addition, he held out the possibility of a fission-free weapon.

Those on the other side of the argument took a much more serious view of the harm caused by the radioactive fallout resulting from nuclear weapons tests. There was little divergence between the scientific analysis of the issue by this group and that of those who minimized the problem of radioactive fallout; the difference between the two groups was in their moral evaluation of the consequences of fallout for mankind. President Kennedy himself was deeply troubled about the problem of fallout. The group opposing the resumption of atmospheric testing also raised broader moral arguments against the resumption of atmospheric tests. In general, they were more concerned about the widespread public opposition to nuclear testing both within the United States and abroad and the effects of the expression of this

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opposition in such forums as the United Nations. They feared that if the United States were to resume atmospheric testing, increased tension would result and that this would diminish the prospects for achieving measures of arms control and disarmament, measures which they considered vital. So far as the military argument was concerned, they felt that the United States had sufficient nuclear weapons to devastate the Soviet Union, and that this was all that was required.

They were sceptical of the need for further testing and felt that only marginal advantages would be gained. President Kennedy shared this appraisal, and according to one of his closest advisers, "talk about a neutron bomb which destroyed only people, not buildings, struck him as foolish in the extreme."^8b

Eventually, despite a final and moving plea by Prime Minister Macmillan, who even proposed convening a summit meeting, the advocates of the resumption of atmospheric tests carried the day. Apparently a clinching argument was one which William C. Foster, Director of the United States Arms Control and Disarmament Agency articulated privately and in public. This was that the United States could not afford to allow the Soviet Union to engage in another test series without having itself tested; that in such circumstances a second test series might give the USSR an important advantage. He felt that if these conditions were to develop it would be difficult for the United States to continue to negotiate for a test ban treaty, among other reasons because it would be unlikely that the Senate would consent to ratification.9 The President found the argument persuasive.

At his Press Conference on February 7, 1962, President Kennedy stated that a final decision on whether or not the United States would resume atmospheric testing would be taken within a month. The following day the White House issued a statement concerning the British decision to allow the United States government to use its facilities at Christmas Island if atmospheric testing were resumed.

Finally, on Friday, March 2, 1962, in a special radio-television broadcast President Kennedy announced that he had that day authorized the Atomic Energy Commission and the Department of Defense to conduct a series of nuclear tests in the atmosphere as

^8bTheodore C. Sorenson, Kennedy, p. 621.
soon as preparations were completed, which would be sometime in April. Kennedy had originally planned to give his talk on March 1, but he agreed to postpone it for twenty-four hours in response to Prime Minister Macmillan's request for further delay. By March 2 the House of Commons would be recessed for the weekend. Although the President did not announce this, the test series would also include some high altitude shots. President Kennedy said that his decision was based on the unanimous recommendation of pertinent Department and Agency heads.

This unanimity had been achieved by way of a compromise. Although the President authorized the resumption of atmospheric tests, he ordered that the series should be limited only to those tests which were absolutely necessary and could not be conducted underground, and that they should be conducted so as to restrict radioactive fallout to the minimum. Partly for these reasons, no high-yield tests were planned; the 1954 15 megaton Bravo shot would stand as the largest ever detonated by the United States. Another factor responsible for this was the continuing view of the Administration that there were no over-riding military requirements for such high-yield weapons. Moreover, because of this reason, and because they had anticipated being able to conduct only underground tests which necessarily would be relatively small, American nuclear scientists had not prepared any designs for high-yield weapons. During the actual test series, the President kept careful control to make certain that his directives were executed.

Another element of the compromise in the recommendation which President Kennedy accepted was the caveat that the decision to resume atmospheric tests would not be executed if the Soviet Union would in the meantime agree to a nuclear test ban treaty. This last feature was designed to satisfy Prime Minister Macmillan as well as elements within the American Administration. Apparently the actual proposal came first from Arthur M. Schlesinger, Jr., a former Harvard history professor serving as Special Assistant to the President. Hugh Gaitskell, the leader of the British Labour Party, also

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made a similar suggestion to Kennedy. Some within the American Administration, including Assistant Secretary of Defense John J. McNaughton, had argued that the offer be made conditional on Soviet acceptance of an atmospheric ban, policed by national detection systems, and such a proposal had even been included in an early draft of the President's 1962 State of the Union message. However, the Departments of Defense and State had objected, and when the offer not to resume atmospheric tests was finally made, they insisted that it be tied to a comprehensive ban.

The President's address was notable for its quality of reluctance and of being forced by Soviet actions into an unpalatable situation. He gave a candid appraisal of the results of the recent Soviet test series—as the United States understood them—and the course of the nuclear test ban negotiations. He found the primary reasons for the United States' decision in these events. However, he also asserted that if the United States were to refrain from atmospheric testing, the leaders of the Soviet Union would

... chalk it up, not to goodwill, but to a failure of will—not to our confidence in Western superiority, but to our fear of world opinion, the very world opinion for which they showed such contempt.

He continued this line of argumentation by asserting that the Soviet Union would never agree to a "true test ban or mutual disarmament" if the West were in a position of weakness.

The Summit Correspondence: A Western Preemptive Gambit

During the same time that consensus was being achieved within the American government on resuming atmospheric testing, there was a flurry of correspondence between Western and Soviet leaders. It was inaugurated on February 7, 1962, by a letter from President Kennedy and Prime Minister Macmillan to Chairman Khrushchev in which they proposed that to facilitate progress on disarmament the three governments should be represented at the opening of the Eighteen-Nation Disarmament Committee by their Foreign Ministers, and that the Foreign Ministers should express their willingness to return to the negotiations as progress achieved by the permanent representatives warranted.11 One of the reasons for this proposal

was to forestall a suggestion, which the two Western leaders knew Chairman Khrushchev would make, that the member states of the Eighteen-Nation Committee on Disarmament should be represented by their heads of government or chiefs of state. Macmillan originally would have been willing to accept this proposal. Indeed, he had made a similar suggestion to Kennedy in early January. Obviously, however, if such a course were to be chosen, Chairman Khrushchev would have an excellent platform from which, among other things, to denounce the Western resumption of atmospheric tests, if this decision were taken, and at that point it seemed likely that it would be. The proposal of the Western leaders reflected their continuing sensitivity to public opinion. Although their preemptive move did not prevent Chairman Khrushchev from making his proposal, it made it easier for the Western leaders to refuse his suggestion.

In all, there were three exchanges of correspondence. It was not until his final letter of March 3, 1962, to President Kennedy that Chairman Khrushchev abandoned his proposal that heads of state represent their governments and accepted the Western suggestion that Foreign Ministers do this. In this letter, which was dated the same day that President Kennedy announced the United States decision to resume atmospheric testing, Chairman Khrushchev also condemned this decision, and asserted that if it were executed, the USSR would “inevitably be forced to meet this challenge too by carrying out its own series of new tests.” In the course of his letter he pointed out that the United States had been the first to test and use nuclear weapons and that the West had conducted many more tests over the years than the USSR. He then asserted the right of the Soviet Union to “be the last side to complete nuclear weapons tests.”

When the formal negotiations for a nuclear test ban reopened, both sides would therefore be more or less committed to another round of tests. And since each side declared that its move was a reaction to the actions of the other, it appeared as if they were engaged in an endless spiral.

At the same time that he aired his suggestion for representation by heads of states with President Kennedy and Prime Minister

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13 Ibid., p. 80.
Macmillan, Chairman Khrushchev also raised it in an exchange of correspondence with General de Gaulle. This not only elicited the negative reaction that it had produced in the other Western capitals, but also the clear statement that France would not participate in the Eighteen-Nation Disarmament Committee because disarmament was a matter which the French felt should be handled exclusively by the nuclear or near nuclear powers. France also reiterated its determination to proceed with its program to develop an independent nuclear capacity unless and until the nuclear powers agreed to ban the manufacture of nuclear weapons and to destroy those in existence.

**The Detection of Underground Tests: Continuing Ambivalence**

While these developments, and especially the imminent round of tests, cast a shadow over the resumption of negotiations for a test ban, there were also some apparently favorable occurrences that came to public attention during the recess in the negotiations. These related to the detection of underground nuclear explosions. On December 10, 1961, as a part of its Project Plowshare, exploring the peaceful uses of atomic energy, the United States detonated a 5 kiloton nuclear device near Carlsbad, New Mexico, in a salt cavern 1,200 feet beneath the surface of the earth. This detonation, which was named Project Gnome, was not a decoupled shot. However, on the basis of the Project Cowboy experiments, it had been estimated that a tamped shot (one where the device is tightly packed in the surrounding medium) in salt, which was what the Gnome shot was, would give a seismic signal smaller by a factor of two and one-half than the seismic signal of a shot tamped in tuff, which is what all of the previous United States detonations had been. Contrary to this prediction, the Gnome shot gave a signal several times greater than Logan, the 5 kiloton tamped-in-tuff shot detonated on October 16, 1958. The Logan shot, it will be recalled, had been one of the principal sources of information for the United States'.
reevaluation of the effectiveness of the control system suggested by the Conference of Experts. By mid-December 1961, it became known that the Gnome shot had been detected at stations as far away as Sweden, Finland, and Japan. In itself, this was an encouraging development, and many exaggerated its significance by assuming that the evidence disproved the decoupling theory, which in fact, it did not. The reason for this erroneous interpretation apparently was that much of the discussion concerning decoupling was framed in terms of nuclear shots conducted in large underground cavities in salt. The test did, however, indicate something about the effects of various media on the transmission of seismic signals from underground nuclear explosions; to wit, a shot tamped in salt would yield a larger signal than one of identical yield tamped in tuff.

The Gnome shot also produced some rather discouraging data, but this aspect was much less widely known and publicized. The Gnome shot made it quite apparent that because of unknown anomalies, seismic signals did not travel through the crust of the earth at uniform speeds, and, as a consequence, it was much more difficult to estimate accurately the epicenter of seismic events from distant seismic stations than had been assumed. This would greatly complicate the problem of on-site inspection of unidentified events. In fact, American scientists discovered that, applying the then current American negotiating position, the actual site of the Gnome shot would have been outside of the area which they would have picked as being legally open to on-site inspection. Moreover, on the basis of the seismic signals they estimated the depth of the shot as 80 miles rather than the actual 1,200 feet. Had they not known the actual facts, they would have concluded that the signals must have been generated by an earthquake rather than an explosion, since no one thought that explosions could be conducted that deep. The reason that distant stations did not reach this conclusion was that the time, location, and yield of the shot had been announced in advance. These somewhat more technical qualifications, however, were overlooked in the public debate.

A second development which sparked public optimism concerning the problem of detecting underground explosions was that

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on February 2, 1962, the Atomic Energy Commission announced that the Soviet Union had apparently set off an underground nuclear explosion earlier that day.¹⁹ So far as was publicly known in the West, this was the first time that the USSR had detonated a nuclear device underground. The announcement stated only that "the yield was well above the threshold of detectability." This vague statement allowed various interpretations. Some experts commented that this meant more than 20 kilotons, but other interpretations were possible. Only later did the United States point out that the Soviet test took place in a normally aseismic area in Central Siberia, near to a fairly well-known weapons proving ground and apparently had a yield of from 40 to 50 kilotons. Had all of these facts been publicized, no one would have doubted that it could have been detected.

The Progress of the Vela Program: Toward a Worldwide Seismological Network

Actually, at this point American scientists felt that the state of technology with respect to the detection of underground nuclear explosions had improved very little. The United States Vela Program had not yet produced significant results, although it had inaugurated a vast number of projects. During fiscal years 1960 and 1961, $51,438,000 had been appropriated for the project, and the estimated budget for fiscal year 1962 was $59,000,000. The research inaugurated under the Vela Program was both basic and applied. As a consequence, among other results, the Vela Program would have an enormous leavening effect on the science of seismology.

Under one aspect of the program the United States Coast and Geodetic Survey undertook to construct a worldwide seismological network. It offered to supply modern calibrated and standardized instrumentation to seismological stations throughout the world, the only conditions being that copies of the records be made available to the Coast and Geodetic Survey. The program envisaged supplying instrumentation for 125 stations, most of which would be outside of the United States. Some of these stations were to be operated by governments, others by private groups, such as universities. Three million, three hundred and seventy-five thousand dollars was pro-

vided for this purpose in fiscal years 1960 and 1961, and $1,175,000 was budgeted for fiscal year 1962. Although Vela Program officials went out of their way to assert that the purpose of this worldwide network was not to detect nuclear explosions in the Soviet Union, but rather to collect earthquake statistics, obviously within the relevant technological limitations, the stations would record all underground seismic events, including nuclear explosions. Data from the initial elements of this worldwide network would become available in quantity in the spring and summer of 1962.

Another part of the Vela Program envisaged the construction of seven seismological stations in the United States designed explicitly to detect nuclear explosions in the Soviet Union, and an analysis center, resembling in some ways the center which, according to American plans, would be established at the headquarters of the control system in Vienna. The first of the seismological stations, a prototype of the stations recommended by the Geneva Conference of Experts, was constructed at Fort Sill, Oklahoma, and became operational in October 1960. As early as July 1961 it was reported that this station appeared to be capable of detecting most seismic events of down to magnitude 4 at distances of 2,000 miles and more. At that time, American scientists thought that this meant that with this station they could locate events as small as about 1 kiloton from distances greater than 2,000 miles, but they could not begin to identify such events until they began to approach 5 kilotons. Nonetheless, the capabilities of the station exceeded American expectations. The reason for this was the demonstration of the possibility of detection and identification of seismic events in what is called the “third zone”; that is, the zone at very large distances beyond “the shadow” or second zone in which detection is very difficult. Eventually the possibility would be completely substantiated. Three more seismological stations would become operational during 1962, and a fifth in April 1963. These stations would have the equipment recommended by the Conference of Experts, and would also incorporate improvements in seismological techniques developed.

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since that time. These improvements were also subsequently added to the Fort Sill Station.

Research with respect to decoupling proved to be the slowest in getting underway. The so-called Dribble experimental program to test the theory of decoupling was established by the Atomic Energy Commission in early 1960. The program envisaged a series of six events, involving both tamped and decoupled shots. In early 1962, because of lack of funds, the program had to be suspended. At that point only certain exploratory drilling and engineering work had been completed. When the program was resumed in September 1962, then being supported by the Department of Defense, the earliest possible date for a decoupled shot would be June 1963. Construction for the first cavity for the Dribble series, a cavity which would accommodate a 100 ton detonation, would ultimately cost $3,200,000 and would require almost a year. By mid-1964 more than that had been spent and construction had not yet started for this cavity. As of September 1965 a nuclear decoupled shot had not yet been fired.

Much of the work conducted under the Vela Program operated under one basic constraint. It was generally felt that it would be impossible to achieve more access to the Soviet Union than would be allowed under the control system which had been recommended in the report of the Conference of Experts. Thus the research was always designed to find improvements which might be applied within the framework of that system, rather than those which might require a major political reorientation. At least some scientists felt that this constraint was a major handicap.

Another constraint—perhaps felt more universally among the scientists participating in the program—was the prohibition prior to September 1961 on conducting any further underground nuclear explosions. This meant that all of the directly relevant work had to be done on the basis of theoretical calculations, and on the basis of the scanty empirical data gathered prior to 1959. When the

22See the testimony of Dr. Richard Latter, Hearings: Developments in the Field of Detection and Identification of Nuclear Explosions, supra note 20, p. 19.
United States resumed underground testing in the fall of 1961, after the Soviet abrogation of the moratorium, this situation changed radically. The United States conducted nine underground tests in the fall of 1961. By mid-1962 this total would be increased to forty-three. Thus a relatively vast amount of new empirical data would become available simultaneously with improved instrumentation at seismological stations throughout the world. Theoretical enquiries launched under Vela were also beginning to bear fruit at about this time.

II

The Eighteen-Nation Disarmament Committee: A New Forum

The Composition of the Committee: Enter the New Eight

All of these factors came into play when the formal negotiations on a nuclear test ban resumed on March 11, 1962, with the opening session of the Eighteen-Nation Disarmament Committee (ENDC). This Committee had been created as a result of bilateral talks between the United States and the Soviet Union in the summer and fall of 1961, and its composition had been endorsed in General Assembly Resolution 1722 (XVI). In the same resolution, the Assembly requested that the Eighteen-Nation Committee should report to it, and directed the Secretary General to facilitate the Committee's work by supplying the necessary services. The Eighteen-Nation Committee therefore met, as the Conference on the Discontinuance of Nuclear Weapon Tests had previously, in the Palais des Nations, in Geneva. By virtue of Assembly Resolution 1722 (XVI), however, the Eighteen-Nation Committee had a somewhat more definite link with the United Nations than the previous conference, and this was underscored during the subsequent negotiations.

Reaching agreement on the composition of the Eighteen-Nation Committee had been the most difficult aspect of the bilateral negotiations. Negotiations on this point were complicated not only because of differences between the USSR and the United States, but also because of controversies among the other members of the United Nations who wished or did not wish to serve on the Committee. In the end, what was agreed to was an expansion of the
old Ten-Nation Disarmament Committee, by adding eight countries belonging neither to the North Atlantic Treaty Organization nor to the Warsaw Pact. The Ten-Nation Committee had consisted of Canada, France, Italy, the United Kingdom, and the United States on one side and Bulgaria, Czechoslovakia, Poland, Rumania, and the USSR on the other. The eight states which were added to make the new Committee were: Brazil, Burma, Ethiopia, India, Mexico, Nigeria, Sweden, and the United Arab Republic.

The question of expanding the membership of the Ten-Nation Committee had actually been under consideration almost since the collapse of the negotiations on general disarmament in the summer of 1960, when the five Communist states withdrew from the Committee.\(^\text{23}\) As early as September 1960, Chairman Khrushchev, acting as the head of the Soviet Union’s delegation to the United Nations, had suggested that the Committee should be enlarged by adding: Ghana, India, Indonesia, Mexico, and the United Arab Republic.\(^\text{24}\) The Western powers rejected this suggestion, principally because adding five nonaligned nations would give the appearance of accepting the Soviet “troika” concept. The following year, however, in bilateral discussions with the USSR in June and July, the United States proposed as alternatives adding either a chairman and two vice-chairmen or ten new members. In either case the new members would be chosen from the group of UN Member States that did not belong to NATO or the Warsaw Pact. The Soviet Union responded by repeating its suggestion of a fifteen-member committee.

These moves to expand the Ten-Nation Committee were given added impetus in September 1961 when the Conference of Heads of State and Government of Nonaligned Countries meeting in Belgrade recommended that the nonaligned states should be represented in all disarmament talks.\(^\text{25}\) The final agreement on the composition of the new Committee was not achieved, however, until December 1961.

The figure of eighteen and the specific countries named were

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\(^{23}\) For an account of the collapse of the negotiations within the Ten-Nation Committee see Bernhard G. Bechhoefer, *Postwar Negotiations for Arms Control*, pp. 551-52.

\(^{24}\) UN Document A/4509.

\(^{25}\) See the declaration and communique, *Documents on Disarmament, 1961*, supra note 5, pp. 374-83, at 381.
both clearly compromises. Since the membership of the new Committee could not be divided into equal thirds, the West felt that it had avoided creating a precedent in favor of the "troika" principle. On the other hand, the Committee did consist of the three groups which figured in that principle. The eight new members of the Committee included three of the five originally suggested by Chairman Khrushchev: India, Mexico, and the United Arab Republic. They also included one European state, Sweden, following a United States suggestion. As the United States insisted, Latin America was given more representation than it had in the original Soviet proposal in that Brazil was added, along with Mexico, which had figured in the Soviet suggestion. Burma, Ethiopia, and Nigeria comprised the final element of the compromise. They were less anti-Western than Indonesia and Ghana, the other two states originally proposed by the USSR.

The composition of the Eighteen-Nation Disarmament Committee meant, among other things, that when the test ban negotiations were resumed within the framework of the Committee, for the first time states would be intimately involved which did not possess nuclear weapons themselves and which were not aligned with any of the nuclear powers. This experience would be quite different from the fleeting exposure of the annual General Assembly debates. Conceivably it could have an impact both on the policies of these states—for it could be a significant learning experience—and on the course of the negotiations.

The Views of the New Members

Significantly, all of the eight countries which were added to the Committee had voted for General Assembly Resolution 1648 (XVI) urging the states concerned to refrain from further nuclear weapons tests pending the conclusion of an international agreement banning such tests. All five members of the Warsaw Pact represented on the Eighteen-Nation Committee had voted against this resolution, as had France, Italy, the United Kingdom, and the United States. Canada, in contrast, had voted for the resolution, and during the sessions of the Eighteen-Nation Committee in 1962 and early 1963 it often took a position closer to that of the eight new members than to that of its NATO partners. Since France boycotted the Eighteen-Nation Committee, this meant that NATO
representation was effectively reduced to three. On the other hand, the five members of the Warsaw Pact acted as a solid unit.

Consisting of two states each from Latin America and Asia, three from Africa, and one from the neutral states of Europe, the eight new members of the committee roughly reflected the membership of the United Nations exclusive of those states belonging to NATO and the Warsaw Pact. Although this was never explicitly stated, it was widely assumed, both within the Eighteen-Nation Committee and in the United Nations, that the eight would represent this broad group of the UN's membership. In any case, by the nature of the situation, by their own inclination, and by the actions of East and West, the eight would introduce a new and independent element into the negotiations, and they would become, as it were, critics of the positions advanced by the two sides. Beyond that, they could also obviously perform the range of functions traditionally performed by third parties in pacific settlement.

Of the eight, Sweden was the only state to have technical advisers continuously attached to its delegation. It was the most advanced state of the new members in terms of technological development and the only one which had figured in the various projections of possible nuclear powers in the foreseeable future. Whether or not Sweden should seek to acquire nuclear capability had been a matter of political discussion within the country. Throughout the negotiations on a nuclear test ban the Swedish delegation included two technical advisers. It also included military advisers. One of the technical advisers was a specialist in the mechanical effects of nuclear explosions, the other was a specialist in nuclear chemistry. Both of them were research organizers in

26 In his account of the Eighteen-Nation Committee, the former Indian representative has noted that Canada "is jokingly referred to at Geneva as the ninth nonaligned country." (Arthur S. Lall, Negotiating Disarmament: The Eighteen-Nation Disarmament Conference: The First Two Years, 1962–1964 (1964), p. 12.) Sir Michael Wright expressed the same view when he wrote that some of the moves which the Diefenbaker government made in the nuclear field served only to cause "embarrassment to Canadian delegates, disarray within the North Atlantic Treaty Organization in their negotiations with others, and irritation in Washington." (Disarm and Verify, p. 132).

their own fields for the Defense Research Organization in Stockholm. In addition, the Swedish delegation relied heavily on advice from the seismological station at Uppsala University. Because of its technical competence, the Swedish delegation played a special role among the eight new members of the Disarmament Committee. It should perhaps also be noted that one of the Swedish specialists on disarmament, Colonel Stig Wennerström, who worked in Stockholm, was arrested in June 1963 on a charge of spying for the Soviet Union and was subsequently convicted.

Several of the delegations of the other new members included diplomats who had had considerable experience in the United Nations, and even some who had participated in past disarmament negotiations. Ambassador Luis Padilla Nervo of Mexico was the delegate who had had the most experience of this nature. He had also been President of the General Assembly. James Barrington of Burma was another diplomat who had represented his country in the United Nations for several years, as had Arthur S. Lall of India.

The Opening of the Eighteen-Nation Committee

For the first few days of the meetings of the Eighteen-Nation Disarmament Committee, because of the acceptance of the Western proposal, most of the states were represented at the Ministerial level. In all instances but one, this meant that the delegation was temporarily headed by the foreign minister. The Indian delegation, however, was headed by V. K. Krishna Menon, Minister of Defense. This reflected the unique role Krishna Menon played for India flowing from his personal relationship with Nehru.

At the second meeting of the Committee on March 15, 1962, the Soviet Union sought to gain the initiative by tabling an entire draft treaty on General and Complete Disarmament. A month would elapse before the United States would take similar action. Tabling this draft treaty could be viewed as a tactic designed to show the reasonableness of Soviet policy; Chairman Khrushchev underscored Soviet power the following day. In a widely publicized address at a Moscow election rally on March 16, he asserted that Soviet scientists had created a new "global" intercontinental missile, which was "invulnerable to antimissile weapons."28 He claimed that

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United States warning systems were now worthless because this missile could approach the United States from altogether different directions than those toward which these systems were aimed. The implication in his view was "that the most realistic way to prevent mass extermination of people in flames of a nuclear war is an agreement on disarmament. . . ." He laid the failure to achieve disarmament solely and squarely to the West. He repeated his threat that if the United States resumed testing nuclear weapons in the atmosphere, the Soviet Union would be forced to respond in kind.

With respect to the test ban negotiations, Chairman Khrushchev asserted, as Foreign Minister Gromyko had the day before in Geneva, that national means of detection provided an adequate basis for a treaty. He said:

... what secret tests of nuclear weapons can one speak about when each one's explosions are practically under the control not only of the two countries but also of other states, including neutral ones, many of which also possess equipment for detection of nuclear explosions?²⁹

In the past the USSR had only argued that tests in the atmosphere, in outer space, and underwater could be detected by national systems. Now Chairman Khrushchev extended that claim to cover underground tests as well. The inclusion of the detection capabilities of neutral states was also an interesting and perhaps significant deviation from past Soviet pronouncements on this matter.

To substantiate his point that national detection systems were adequate, Chairman Khrushchev mentioned the detection and announcement of the Soviet underground test of February 2, 1962, by the United States government. He declared that this test had been conducted to trap the United States into disproving its contention that underground tests could not be detected by national systems. Soviet negotiators would recount this incident often in the subsequent negotiations.

The American opening gambits in the Eighteen-Nation Disarmament Committee were much less dramatic. On the same day that Foreign Minister Gromyko tabled the Soviet draft treaty on General

²⁹Ibid., p. 155.
and Complete Disarmament, Secretary of State Dean Rusk outlined a number of proposals—which the United States would advance in the coming negotiations in concrete form—relating to general and complete disarmament and to partial measures. Somewhat later that day in a private conversation among the United States, United Kingdom, and USSR representatives, Ambassador Dean presented an aide mémoire to Ambassador Tsarapkin proposing modifications in the Western position with respect to a test ban. The aide mémoire proposed four modifications to the basic Western position as expressed in the United States-United Kingdom draft treaty of April 18, 1961, and the three amendments of May 29, 1961 and August 30, 1961.30

The first modification concerned provisions for safeguarding other states against a surprise abrogation. Two specific measures were envisaged: periodic declarations on the part of heads of state that there were no preparations for testing; and provision for limited and agreed rights to inspect declared test sites a certain number of times each year.

The second modification related to shortening the time spent before the inauguration of the inspection process. This involved principally the functioning of the Preparatory Commission and the scheduling of the establishment of control posts.

The third revision was more designed to appeal to the Soviet Union. The Western powers were willing to eliminate the 4.75 seismic magnitude threshold from the outset and to make the treaty comprehensive. Ambassador Dean, Jerome B. Wiesner, and others had long urged that the threshold be dropped. They felt that given the uncertainty about the determination of seismic magnitude there would be endless arguments about whether or not an underground event had generated a seismic signal that was over the threshold. Moreover, since in previous Western proposals there could be no inspections beneath the threshold, they were convinced that the USSR would have a magnificent opportunity to engage in clandestine testing. British policy-makers also shared these views.31 Finally, Secretary Rusk and President Kennedy were persuaded and the threshold was dropped.

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The final modification was also designed as a compromise to the USSR. According to it, the Western powers were willing to contemplate, within the framework of an overall quota on on-site inspections, a further limitation on the number of inspections in normally aseismic areas. Thus the greater number of inspections in the Soviet Union would be confined to an extremely limited area, mainly in East Siberia and South Central Siberia, and only a few would be allowed in the heart of the country.

In the informal meeting, the Soviet Union rejected these proposals immediately. The United States offered as an alternative suggestion the possibility of immediately signing the United States-United Kingdom draft treaty of April 18, 1961, with the three amendments. This was also unacceptable to the Soviet Union.

Deadlock in the Subcommittee

Obviously the two sides were no nearer agreement, and perhaps were even farther apart, than they had been when the Geneva Conference on the Discontinuance of Nuclear Weapon Tests ended on January 29, 1962. This became glaringly apparent in the meetings of the Subcommittee on a Treaty for the Discontinuance of Nuclear Weapon Tests. The Eighteen-Nation Committee created this Subcommittee, consisting of the Soviet Union, the United Kingdom and the United States, on March 21. The fact that the negotiations on a nuclear test ban were resumed under physical arrangements which were practically identical to those which had previously existed—the representatives of the three states met in private again in the Palais des Nations—should not obscure the important psychological difference. The three representatives now comprised a Subcommittee, responsible to the larger ENDC. As a consequence of this, new pressures would become operative, even though they were not immediately apparent.

In the first meeting of the Subcommittee, on March 21, the United States formally presented the new Western proposals, and the Soviet Union in turn formally rejected them. Mr. Tsarapkin bluntly asserted that no agreement would be possible "on such an utterly discredited basis." He went on to assert that the USSR would only agree to a test ban which would rely solely on national

32ENDC/SC. 1/PV. 1, p. 9.
systems for control. He argued that the only reason for the Western insistence on international control was the desire to obtain opportunities to engage in espionage. The Western powers, on the other hand, maintained that they could only have confidence that a treaty banning nuclear weapon tests was being fulfilled if there were an international control mechanism. They were, however, willing to consider various possibilities: their new proposals, the draft treaty of April 18, 1961, with amendments, or any suggestion that the Soviet Union might offer as long as it met their criterion of effective control.

The Soviet position, as developed in this meeting and the next, was that it was common knowledge that all atmospheric tests could be detected by national systems. Mr. Tsarapkin cited as evidence the offer which President Kennedy and Prime Minister Macmillan made on September 3, 1961. He argued that national systems were:

... equally if not more applicable in the case of nuclear explosions set off underwater or at high altitudes. And now that the techniques of detecting and identifying nuclear explosions have made considerable progress, they are also applicable to underground nuclear explosions.  

Nevertheless, he continued to stand by the Soviet proposal of November 28, 1961, which implied that some international control measures would ultimately be established for monitoring underground tests.

The Western position did not distinguish the problems of detecting nuclear weapons tests in the various environments, but merely asserted that the report of the Conference of Experts had demonstrated the necessity for an international control system. Thus the situation was almost the reverse of what it had previously been when the Soviet Union had argued that the negotiations had to be based on the report of the Conference of Experts and the Western powers had maintained that new information had to be introduced. Ambassador Dean stated that the proposal to eliminate the threshold in the treaty was advanced despite the fact that the United States did not think that there had been "any great advance in the ability to detect events underground below 4.75."  

Curiously, in the plenary session

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33ENDC/SC. 1/PV. 2, p. 10.
34Ibid., p. 22.
the following day Secretary of State Dean Rusk stated that the proposal to eliminate the threshold was based on "increased experience and increased scientific knowledge."\textsuperscript{85}

The confusion which could result from these conflicting pronouncements and from the Western failure to specify the problems of detection in the various environments was exacerbated by frequent statements of Western scientists, which were widely reported in the Western press, concerning the problems of detecting nuclear weapons tests. Many of these claimed that the problems were not as difficult as the diplomats of the United States and the United Kingdom claimed. The Soviet Union used these statements to buttress its case in the Subcommittee. But other than such statements, it could offer little proof that the scientific situation had in fact changed. The position of both sides, therefore, looked somewhat murky.

In addition to stating their respective positions concerning what arrangements for the discontinuance of nuclear weapons tests would be acceptable to them, the two sides engaged in a bitter debate about the Western decision to resume atmospheric tests and the Soviet abrogation of the moratorium. Each blamed the other for increased tensions.

\textit{The Debate in the Full Committee}

After two fruitless sessions, the Subcommittee reported the impasse to the full Eighteen-Nation Committee. This occasioned a full dress debate. By and large the foreign ministers of the three nuclear powers merely reiterated the positions which their representatives had voiced in the Subcommittee. There was, however, one important exception. Foreign Minister Gromyko stated that an international agreement on the discontinuance of nuclear weapons tests would only be possible if it were signed by "the Governments of all the nuclear Powers."\textsuperscript{36} He then made it clear that this meant that France would have to sign a test ban treaty.

The only representative of the new members of the Eighteen-Nation Disarmament Committee to offer a positive suggestion at this meeting was F. C. de San Thiago Dantas of Brazil. He said:

\textsuperscript{85} ENDC/PV. 8, p. 17.
\textsuperscript{36} Ibid., p. 25.
It is very obvious that all inspection depends, in the first place, on very accurate knowledge of the technical means available for verifying the implementation of the clauses of a treaty. An exchange of scientific information is essential, in order that States may have the same stock of knowledge and technical means for verifying the implementation of the agreements concluded. At the same time, it is clear that means of inspection must be provided, insofar as our common need requires.\(^{37}\)

Although in some ways this statement could be considered an endorsement of the Western position, it also reflected the doubts among the new members about the arguments advanced by both sides caused by the conflicting claims with respect to the technical possibilities of detection. Several of them alluded to this in earlier discussions.

Prior to this debate, several of the members of the Eighteen-Nation Disarmament Committee, including many of the new members, had from time to time discussed the question of the test ban negotiations in the plenary sessions. All of the Communist countries and all eight of the new members and Canada had expressed their opposition to nuclear tests. Many of them referred to General Assembly resolution 1648 (XVI) requesting states to refrain from further testing of nuclear weapons, and several expressed the hope that the United States would not conduct the planned series of atmospheric explosions. In the view of all of the members of the Committee, the imminence of this test series made the problem of achieving an agreed treaty especially urgent. President Kennedy, after all, had pledged not to conduct the tests if an agreement could be achieved.

In addition to expressing their opposition to nuclear tests in general and to the forthcoming American series in particular, some of the eight new members introduced, always in a most tentative fashion, a number of new ideas in these early discussions. As early as the third session, F. C. de San Thiago Dantas of Brazil argued that since it was generally agreed that nuclear weapons tests underwater and in the atmosphere and in the biosphere could be detected and identified without on-site inspection or the establishment of an

\(^{37}\text{Ibid., p. 33.}\)
elaborate control mechanism, these tests should be suspended immedi­ately.\textsuperscript{38}

Two sessions later, V. K. Krishna Menon made the same point and added that tests in the atmosphere and biosphere were the main tests that people were worried about at the moment.\textsuperscript{39} He also argued that, short of the establishment of a world state, all that could be done in the event of a violation of an arms control agreement would be to establish proof of the violation. In his view, in the case of an atmospheric test such proof could easily be obtained. Finally, the Indian Defense Minister pointed out that several stations for data collection, for instance, for measuring radiation, already existed in the world, and using these stations as an example, he suggested the possibility of establishing other "scientific detection stations" by both national and international efforts. As he put it, "The more people who watch, the less avoidance there will be."\textsuperscript{40} In many ways his suggestion built upon a resolution which the General Assembly had adopted the previous fall, 1629 (XVI), which had urged the collaboration of national efforts and those of the World Meteorological Organization and the International Atomic Energy Agency in extending the present meteorological reporting system to include measurement of atmospheric radioactivity.

Ato Ketema Yifru, Foreign Minister of Ethiopia, introduced a final new idea at the sixth session. He asked whether or not it would be possible "to devise an international scientific system of verification where an appeal could be lodged to resolve differences in results of national detection systems?"\textsuperscript{41}

At this point, however, these were only isolated individual suggestions. They were not advanced as proposals, and they did not appear to elicit any significant response. They did, though, constitute a nucleus around which proposals could be formulated. They also set a precedent, and a pattern was established in these early talks which was to prevail throughout 1962. It was a pattern of parallel talks. Specific negotiations would be conducted in the Subcommittee of the three nuclear powers. Meanwhile, the other members of the Eighteen-Nation Committee would scrutinize the record of these detailed talks

\textsuperscript{38}ENDC/PV. 3, p. 9.
\textsuperscript{39}ENDC/PV. 5, p. 39.
\textsuperscript{40}Ibid., p. 40.
\textsuperscript{41}ENDC/PV. 6, p. 20.
and raise questions and introduce suggestions in the plenary sessions. These parallel talks would be punctuated by periodic reports from the Subcommittee to the full Committee and full dress debates. Simultaneously with these talks on the record, there would also be a series of informal discussions, both among the three nuclear powers and the entire membership of the Eighteen-Nation Committee.

The Subcommittee Resumes and American Scientists Return to Geneva

On March 28, the tripartite Subcommittee resumed its negotiations. The two sides clung adamantly to their positions. The Soviet Union continued to insist that it would only agree to a treaty based on national detection systems, while the Western powers, on the other hand, insisted that an international control system would be necessary.

Both sides elaborated the technical situation as they understood it. The Soviet Union repeated and expanded the arguments that it had developed in the first two sessions of the Subcommittee. Ambassador Tsarapkin boasted that the predictions of the Soviet scientists in 1958 had been borne out, that the situation with respect to the detection of nuclear weapons tests had improved, even more than had been expected.42 However, he continued to differentiate slightly between the situation with respect to nuclear weapons tests in the atmosphere, in outer space, underwater, and those underground.43 He asserted that tests in all environments could be detected by national systems, but was somewhat less positive in the latter instance. To prove his point about underground tests, he cited those which had been detected, and claimed that the detection of the Gnome shot by distant stations had disproved the decoupling theory.44

The two Western powers took much greater care to refute the Soviet arguments than they had during the opening sessions of the Eighteen-Nation Committee. This effort started when the interim report of the Subcommittee was presented to the full Eighteen-Nation Committee. At that time, Dr. Jerome B. Wiesner, Special Assistant to the President for Science and Technology, and other American scientists came to Geneva and made themselves available—especially

42ENDC/SC. 1/PV. 4, p. 8.
43See ENDC/SC. 1/PV. 8, pp. 22-23.
44ENDC/SC. 1/PV. 4, pp. 4-5.
to the eight new members of the Committee—to explain the technical situation as the United States understood it. Dr. Wiesner, in particular, was widely known among the representatives of the neutral nations and greatly respected. He and the other American scientists came to play an important teaching role in the Conference.

In the Subcommittee and in plenary sessions both Ambassador Dean and Mr. Godber developed the Western position for the record. Now they began to distinguish between the various environments and to acknowledge that most, or as they sometimes put it, "the larger," tests in the atmosphere could be detected by national systems. They maintained that although it was conceivable that tests in outer space and underwater could be detected by national systems, at present no national systems for such purposes were in existence.45

The Western representatives stated that they felt that the majority of underground events could be detected, but that in many cases it would be difficult to distinguish whether they were caused by earthquakes or nuclear explosions, and that in any case, the only way positively to identify an underground nuclear explosion was through obtaining radioactive debris by means of an on-site inspection. At a news conference in Washington, President Kennedy also sought to establish the difference between the detection and identification of underground events.46 It was difficult to get many of the delegates of the eight new members of the Committee to make this distinction. Even the Swedish scientists, including those at Uppsala, were somewhat careless in this respect.

To illustrate the limitations on the distant detection of underground nuclear explosions, Ambassador Dean pointed out that of the current United States series of underground tests the Gnome shot had been the only one to be detected in Sweden. He also said that during the moratorium on nuclear testing, from the late fall of 1958 until its abrogation by the Soviet Union in 1961, United States scientists had recorded "hundreds of seismic or acoustic signals . . . and some of them may have looked as if they could have been caused by a secret underground nuclear detonation."47 The United States did not raise questions because of its fear of upsetting the negotiations.

45ENDC/PV. 19, p. 38, and ENDC/SC. 1/PV. 8, p. 6.
47ENDC/SC. 1/PV. 4, p. 23.
Concerning the Gnome shot, Ambassador Dean agreed that it had confounded the predictions of American scientists with respect to the effects of various media on the transmission of seismic signals.\(^{48}\) However, he pointed out that since it was tamped the Gnome shot was irrelevant to the question of decoupling.

It was not long before the presence in Geneva of the American scientists began to have an impact. As early as April 2, the Swedish delegate, R. Edberg, stated that to the best of his knowledge there was "no real or marked discrepancy between the view of American scientists and our own as to the detectability and possibility of identifying seismic events."\(^{49}\) The Western representatives sought to press this advantage by suggesting that there should be a meeting of scientists from East and West to go over the technical situation. The Soviet rebuttal was to cast aspersions on the motives of the scientists that the Western governments had sent to Geneva in the past.\(^{50}\)

Simultaneously with their efforts concerning the technical situation, the Western representatives sought to prove that the Soviet fears with respect to espionage were groundless. They pointed out the elaborate safeguards that they were willing to have the host country establish and the minute portion of the Soviet Union which would be subjected to on-site inspection in any year.

_The Eight-Nation Memorandum: A Synthesis with Deliberate Ambiguity_

Despite the fact that the West might have had the better of the oral presentations during this period, it was the side that was about to open a series of atmospheric tests, and thus was in many ways the more vulnerable to criticism. Even as early as the interim report of the Subcommittee, though, it was apparent to many that the Soviet Union was at least equally, if not more, determined than the West to hold another round of atmospheric tests.\(^{51}\) In the plenary sessions, several of the delegates of the eight new members stated their belief that both East and West were determined to carry out new series of atmospheric tests. Since the American tests were imminent (and perhaps for other reasons as well), however, they con-

\(^{48}\)ENDC/SC. 1/PV. 6, p. 18.
\(^{49}\)ENDC/PV. 13, p. 47.
\(^{50}\)See ENDC/SC. 1/PV. 4, p. 32.
centrated their pressure on the United States. On April 12, Ambas­
sador Lall of India, on the instruction of his government, appealed to the governments of the nuclear powers "not to resume nuclear tests during the pendency of this Conference...."52 It should be noted parenthetically that on this occasion and on each subsequent occasion when he asked the nuclear powers to forego testing, he stressed the "nth country" problem as a primary reason, arguing that if the nuclear powers continued to test, other powers would do so also. Obviously India was perturbed by a particular "nth country" problem, the People's Republic of China. In October of 1962 heavy fighting would break out on the Sino-Soviet border. The Soviet response to Ambassador Lall's appeal was to reiterate its stand that it would pledge not to conduct tests during the meetings of the Eighteen-Nation Committee if the Western powers did also.53 The Western powers retorted that they could not again agree to an un­policed moratorium; they would only agree to forego their planned tests if a treaty with effective control were signed in the interim.54

An exchange of statements and correspondence between Prime Minister Macmillan and President Kennedy on the one hand and Chairman Khrushchev on the other produced virtually the same re­
sult.55 It also gave Chairman Khrushchev an opportunity to restate his threat that the Soviet Union would resume testing if the United States inaugurated its planned atmospheric series.

As the days went by, the eight new members of the Committee became increasingly concerned about the imminence of resumed atmos­pheric testing. Several of them thought that they should break off the Conference if the United States executed its plans, and some members of the United Nations Secretariat who were providing the supporting services for the Conference also took this position.

Meanwhile, in the discussions in the plenary sessions, individual representatives of the eight had added their suggestions to those which some of them had already made. James Barrington, of Burma, sug­gested the creation of an international scientific commission, though not as elaborate as the organization envisaged in the Western plans,

52ENDC/PV. 19, p. 7.
53Ibid., p. 21.
54Ibid., pp. 21-23.
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which could settle disputes which might arise from conflicting interpretations of data derived from national detection systems. He thought that such a commission would probably have to have the right to conduct an agreed number of on-site inspections. Other delegates further developed this and the previous suggestions.

Eventually, the delegations of the eight nations decided that they should combine their efforts in a concerted attempt to break the deadlock in the negotiations. Actually, the origins of this move can be traced to the reactions of some of the eight delegates to the initial report of the Subcommittee, which made the impasse plainly apparent. Sweden and India played a leading role in formulating the concerted action for the eight. India mainly contributed ideas of a constitutional and legal character. The Swedish delegation brought to the task considerable technical knowledge, as well as definite ideas about the political and legal arrangements that could be implemented in an arms control agreement. Swedish scientists were convinced that the chances of an on-site inspection's actually obtaining radioactive debris were not very great and this diminished the importance of such inspections in their view. (As time went on, American scientists would increasingly share this pessimism with respect to the results of on-site inspections.) Moreover, the Indian and the Swedish delegations concluded that in the event of a violation of a nuclear test ban agreement, the only recourse and sanction would be for the other side to resume testing. Finally, the Swedish delegation felt that control mechanisms should be constructed as far as possible as appendages to other more normal activities of scientific installations. The Swedish delegation thought that General Assembly Resolution 1629 (XVI) which dealt with increasing the capacity of the existing world meteorological network to measure radioactivity was an example of the kind of thing that should be done. In developing this notion, the Swedish delegation was in close touch with the head of the International Union of Geodesy and Geophysics. This group was actively promoting the creation of an international center for seismology, and international cooperation in this field was

56ENDC/PV. 13, p. 7.

57Many of these thoughts are summarized in a speech given by R. Edberg on April 2, 1962: ENDC/PV. 13, pp. 47-49.
an item on the agenda of the United Nations Economic and Social Council in 1962.

After considerable deliberation, the representatives of the eight new members of the Committee ultimately formulated a memorandum, a process which took several weeks. Many of the speeches of the representatives of the eight, mentioned above, in which suggestions were tentatively broached, reflected this process. The actual drafting of the memorandum was done by the representatives of Ethiopia, India, and Sweden, and the Indian delegate, Arthur S. Lall, was particularly influential in preparing the final version of the proposal. In the American view Ambassador Lall’s influence was not helpful; it resulted in a “less intelligent document.” Ambassador Lall himself, who was particularly close to Krishna Menon and resigned his post after Mr. Menon resigned as Defense Minister, felt that his contribution was to make the proposal more equidistant between the positions of East and West.

The Eight-Nation Memorandum was presented to the plenary meeting on April 16, ten days before the United States atmospheric tests were scheduled to begin. It was, however, shown to the Soviet and American representatives prior to its formal presentation, and had been shown to the Canadian delegation even earlier. The memorandum was an amalgam of the views of the eight, especially those of India and Sweden. In this memorandum, the eight urged the nuclear powers to persist in their efforts to achieve a test ban treaty. After noting that despite the differences that existed among the nuclear powers concerning a test ban treaty there were “also certain areas of agreement,” the memorandum proclaimed their belief that “possibilities exist of establishing by agreement a system for continuous observation and effective control on a purely scientific and nonpolitical basis.”

Such a system might be based and built upon already existing national networks of observation posts and institutions, or if more appropriate, on certain of the existing posts designated by agreement for the purpose together, if necessary, with new posts established by agreement. The existing networks already include in their scientific en-

58Arthur S. Lall, Negotiating Disarmament, pp. 20-21.
59ENDC/28. The following quotations are taken from that document.
deavors the detection and identification of man-made explosions. Improvements could no doubt be achieved by furnishing posts with more advanced instrumentation.

In addition, the memorandum suggested that “the feasibility of constituting an International Commission, consisting of a limited number of highly qualified scientists, possibly from non-aligned countries together with the appropriate staff might be considered.” It then went on to outline the functions of such a commission.

This Commission should be entrusted with the tasks of processing all data received from the agreed system of observation posts and of reporting on any nuclear explosion or suspicious event on the basis of thorough and objective examination of all the available data. All parties to the treaty should accept the obligation to furnish the Commission with the facts necessary to establish the nature of any suspicious and significant event. Pursuant to this obligation the parties to the treaty could invite the Commission to visit their territories and/or the site of the event the nature of which was in doubt.

5. Should the Commission find that it was unable to reach a conclusion on the nature of a significant event it would so inform the party on whose territory that event had occurred, and simultaneously inform it of the points on which urgent clarification seemed necessary. The party and the Commission should consult as to what further measures of clarification, including verification in loco, would facilitate the assessment. The party concerned would, in accordance with its obligation referred to in paragraph 4 above, give speedy and full cooperation to facilitate the assessment.

After the International Commission had made a full examination of the facts, according to the Eight-Nation Memorandum, it would inform all of the parties of the treaty of the circumstances of the case and of its assessment. The parties to the treaty would be free to determine their reaction after receiving this report. The eight nations offered their suggestions, in their words, “so as to save humanity from the evil of further nuclear tests.”

As would soon become apparent, the two paragraphs quoted above could be subject to varying interpretations. An earlier draft had more clearly stated an obligation to accept on-site inspections, but this had been obfuscated at the insistence of Ambassador Lall.
The Negotiations Resume

The Response to the Eight-Nation Memorandum

The nuclear powers responded to the Eight-Nation Memorandum in rather different ways. The day after it was presented, both the American and the British representatives raised a series of detailed questions, seeking clarification so that they could better inform their governments. Essentially these questions were designed to probe the scientific, technical, and political implications of the general propositions in the memorandum. One of the most important was whether on-site inspections would be obligatory or voluntary. The delegates of the eight nations did not give an immediate answer, but the Burmese delegate did suggest that the question should be submitted in writing. Two days later, speaking for the eight, P. Sahlou stated that the memorandum would have to stand by itself; they would not interpret it. He said that the memorandum had been put forward in the hope of facilitating a new approach and that only the nuclear powers themselves could negotiate a treaty. Mr. Sahlou added, though, that the eight nations would be willing to cooperate with the nuclear powers in any or all aspects of the new negotiations and that they were prepared to offer whatever scientific collaboration they could. In addition some of the eight did discuss their views in private.

There were several reasons for the eight taking the position that they did. In the first place, Ambassador Lall was adamant that they should. Secondly, the memorandum represented several compromises among the eight. To eliminate the ambiguities and to elaborate the general provisions would have risked destroying these compromises. It probably would have been impossible to draft a joint explanation, and individual explanations would have been divergent. Thirdly, had the eight been more explicit in their memorandum, they would have been drawn into the heart of the controversy between the two nuclear sides. The eight were firmly convinced that a test ban treaty could only be achieved by agreement among the nuclear powers, and that they would not facilitate such an agreement by seeming to favor one or the other side. Finally, several of the delegates of the eight states felt that if they were to be more explicit than they had been in the

60See ENDC/PV. 22, pp. 20-26.
62ENDC/PV. 24, pp. 5-7.
memorandum, they would risk going far beyond their technical depth.

Immediately after Mr. Sahlou spoke, Ambassador Zorin read a prepared statement which praised the memorandum and stated that the Soviet Government accepted it as a basis for the continuing negotiations.63 Ambassador Dean was more cautious.64 Although he declared that his delegation was prepared and willing "to give the most serious consideration" to the Eight-Nation Memorandum, he said that he was concerned that there was an element of voluntariness with respect to on-site inspections. He stated that the United States could not sign a treaty in which there was any ambiguity about the commitment of each party to agree to effective international control and to objective, scientific on-site inspection's taking place under certain specified conditions. He went on to say that the United States never expected that an inspection team could force its way onto the territory of a state where an unidentified event had occurred to conduct an inspection, but that the United States wanted it to be clear which side was guilty of breaking international law. If a state legitimately could refuse an on-site inspection, then the onus of breaking a treaty would fall, not on the state which might have violated the treaty, but on the other side.

Continued Deadlock: An Exercise in Exegesis

From that point until the Eighteen-Nation Committee recessed on June 14, 1962, the Eight-Nation Memorandum in fact became the basis for the negotiations. All of the discussions in the tripartite Subcommittee were based on it, and it served as the focal point in those plenary meetings when the nuclear test ban issue was discussed. Despite this new element, however, the negotiations continued to flounder.

Since the eight new members of the Committee refused to interpret their memorandum, each side was free to place whatever construction it chose on the document. Both tended to interpret it in terms of their past proposals.65 As early as April 24, 1962, the Western powers were arguing that the Eight-Nation Memorandum

63Ibid., pp. 7-11.
64Ibid., pp. 15-21.
65See, for example, the speeches of Dean and Tsarapkin: ENDC/SC. 1/PV. 10, pp. 12-19, and ENDC/SC. 1/PV. 12, pp. 3-6.
provided for obligatory on-site inspection. The Soviet Union, of course, staunchly denied this. Of all the points of difference, this was the most crucial. As the days wore on, the speeches of the two sides became increasingly complicated by divergent exegeses of the memorandum.

From the outset, the United States had suggested that it might be helpful to have one or more of the eight nations sponsoring the memorandum participate in the work of the Subcommittee. But the USSR rebuffed this suggestion, arguing that the matter should either be discussed among the states principally concerned, that is the nuclear powers, or in the full Committee. Since this was the original pattern, no change in organizational structure was made. When the test ban was discussed in the meetings of the plenary Committee, the eight nations continually refused to be drawn into an interpretation of their memorandum to resolve the conflicting interpretations that had developed. Thus the schism grew in the fashion of medieval theological controversies.

III

The Sign and Poignance of Failure

*The United States Resumes Atmospheric Testing*

Meanwhile, on April 26, 1962, the United States resumed atmospheric testing. Two days previously, Ambassador Lall, on behalf of the government of India, had made a last minute appeal to the nuclear powers "not to undertake any testing of nuclear weapons" during the period that the Eight-Nation Memorandum was being considered. That same day, President Kennedy authorized the Atomic Energy Commission and the Department of Defense to proceed with the planned tests.

On the day of the United States' resumption of atmospheric testing, only the delegates of Italy, the United Kingdom, and the United States supported the American action in the Eighteen-Nation Disarmament Committee. All of the other delegates expressed regret, and varying degrees of sorrow, dismay, and recrimination. The fact that

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66ENDC/PV. 24, p. 15.
67ENDC/PV. 34, p. 5.
as recently as April 24 the Soviet Union had proclaimed its intention to reply in kind, increased the distress of many of the delegates, but also made some of them slightly less harsh in their criticisms of the West.

Within the United States, even after the decision to resume atmospheric testing was a foregone conclusion, the debate about this policy continued. Now it was phrased exclusively in terms of the extent to which the test series should be limited. The Department of Defense wanted the series to be enlarged to include proof testing of existing weapons systems in the American stockpile to test their actual effectiveness as systems and to measure the extent of deterioration. This was opposed by the Atomic Energy Commission and the President's science advisers who wanted to minimize the number of tests. Although the President ultimately allowed some proof tests, he insisted that the overall number of tests and their yield should be kept to an absolute minimum. As a consequence, the total series had a yield of approximately twenty megatons. The Soviet series in the fall of 1961 had had a yield of almost ten times as much. When the Soviet, American and British, and French test programs were totaled, more nuclear weapons had been tested in 1962 than in any other year, and the megatonnage of the tests conducted from September 1961 until December 1962 surpassed that of all previous years.

Efforts to Break the Stalemate

Several members of the Eighteen-Nation Committee vainly sought to break the stalemate. Some of these efforts again sought to use science and scientists as a means of achieving agreement. At a very early stage, Italy suggested convening a meeting of scientists from the three nuclear powers and the eight new members of the Committee to go over the implications of the Eight-Nation Memorandum. Somewhat later, in the Subcommittee, the United Kingdom suggested the convocation of a meeting of technical experts to

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72Earl H. Voss has stated that the repeated false starts in the 1962 program appeared to confirm the need for proof testing (Nuclear Ambush, p. 474).
73ENDC/PV. 27, p. 37.
assess national systems of detection so that their adequacy could be evaluated and the extent to which they needed to be supplemented could be estimated.\textsuperscript{74} As the prompt and cursory rebuff which the Soviet Union gave these proposals indicated, they were partially designed to embarrass the USSR. At the same time, they also seem to have stemmed from a genuine belief that there must be a "scientific" and objective solution to these problems. This is attested to by the fact that one of the eight new members of the Committee, Sweden, suggested that a scientific inventory of the existing facilities and a blueprint of how they might be brought into more effective cooperation would be useful as a starting point for more fruitful negotiations.\textsuperscript{75}

As another way of attempting to induce agreement, Ambassador Padilla Nervo of Mexico suggested the establishment of a cut-off date for the discontinuance of nuclear weapons tests.\textsuperscript{76} As he explained it, this would be a way of ending the seemingly endless spiral of tests and answering tests and it would also be a means of putting some pressure on the negotiators. After making these comments, he went on to single out atmospheric tests as being "the greatest stimulus to the arms race" and also the most harmful to public health. They also could "be recorded and identified without any doubt." Therefore, in his view, these tests especially should obviously be discontinued. Sweden backed the Mexican suggestion in a later public meeting, and several other of the eight new members also did so in private.

In the Subcommittee, the United Kingdom sought to indicate flexibility—a tactic which occasionally caused some concern within the United States delegation and in broader American circles—and to emphasize areas of agreement. Some among the eight new members of the Committee also stressed the extent of agreement. By June the delegates of Sweden and India proclaimed that the gap between the sides had been narrowed somewhat.\textsuperscript{77}

\textit{Despondency Among the Eight}

Ambassador Padilla Nervo, on the other hand, felt that the nuclear powers were no nearer to agreement than they had been in

\textsuperscript{74}ENDC/SC. 1/PV. 14, p. 6.
\textsuperscript{75}ENDC/PV. 52, p. 29.
\textsuperscript{76}ENDC/PV. 34, pp. 13-19.
\textsuperscript{77}See ENDC/PV. 52, pp. 27-29; and ENDC/PV. 53, pp. 15-18.
March when the Eighteen-Nation Disarmament Committee opened. He spoke bitterly of the continued nuclear testing, especially the plans to conduct shots in outer space, an environment which he felt was *res communis*. In his view this demonstrated how the nuclear powers ignored the wishes and interests of other states. The Brazilian delegate echoed his sentiments:

There is an understanding between the two great powers that they will use their power, their strength, their determination, and their will to carry out these tests, taking advantage of their technical abilities in order to use universal property, the property of all the peoples of the world—space, the seas and all the possibilities of nature—and that in the exercise of this will and taking advantage of this property, they will commit acts which are obviously in their own interest, but are against the interests of all the other Powers.

He, and others from the delegations of the eight new members of the Committee, protested but with a sense of futility. He feared the historical situation would not be favorable for a resumption of real negotiations on a nuclear test ban until the end of the following year, after both sides had conducted tests, and the results had been collected, examined, and studied.

Perhaps history would prove the correctness of his views. Meanwhile, transferring the test ban negotiations to a new forum and interjecting the views of the non-nuclear powers appeared to have had no effect toward advancing an agreement.

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79 Ibid., p. 28.