

COMMONWEALTH PRIME MINISTERS' CONFERENCE

March 1961

Principles for disarmament agreement

The text of the statement on disarmament, referred to in the communique as annex I, was as follows:

- (1) The aim must be to achieve total world-wide disarmament, subject to effective inspection and control.
- (2) In view of the slaughter and destruction experienced in so-called "conventional" wars and of the difficulty of preventing a conventional war, once started, from developing into a nuclear war, our aim must be nothing less than the complete abolition of the means of waging war of any kind.

Principles

- (3) An Agreement for this purpose should be negotiated as soon as possible, on the basis of the following principles:
 - (a) All national armed forces and armaments must be reduced to the levels agreed to be necessary for internal security.
 - (b) Once started, the process of disarmament should be continued without interruption until it is completed, subject to verification at each stage that all parties are duly carrying out their undertakings.
 - (c) The elimination of nuclear and conventional armaments must be so phased that at no stage will any country or group of countries obtain a significant military advantage.
 - (d) In respect of each phase there should be established, by agreement, effective machinery of inspection, which should come into operation simultaneously with the phase of disarmament to which it relates.
 - (e) Disarmament should be carried out as rapidly as possible in progressive stages, within specified periods of time.

- (f) At the appropriate stage a substantial and adequately armed military force should be established to prevent aggression and enforce observance of the disarmament agreement; and an international authority should be created, in association with the United Nations, to control this force, and to ensure that it is not used for any purpose inconsistent with the charter.
- (4) On the basis of the above principles it should be possible, given good will on both sides, to reconcile the present differences of approach between the different plans put forward.

Negotiations

- (5) The principal military powers should resume direct negotiations without delay in close contact with the United Nations, which is responsible for disarmament under the charter. Since peace is the concern of the whole world, other nations should also be associated with the disarmament negotiations, either directly or through some special machinery to be set up by the United Nations, or by both means.
- (6) Side by side with the political negotiations, experts should start working out the details of the inspection systems required for the measures of disarmament applicable to each stage, in accordance with the practice adopted at the Geneva nuclear tests conference.
- (7) Every effort should be made to secure rapid agreement to the permanent banning of nuclear weapons tests by all nations and to arrangements for verifying the observance of the agreement. Such an agreement is urgent, since otherwise further countries may soon become nuclear powers, which would increase the danger of war and further complicate the problem of disarmament. Moreover, an agreement on nuclear tests, apart from its direct advantages, would provide a powerful psychological impetus to agreement over the wider field of disarmament.
- (8) Disarmament without inspection would be as unacceptable as inspection without disarmament. Disarmament and inspection are integral parts of the same question and must be negotiated together; and both must be made as complete and effective as is humanly possible. It must, however, be recognized that no safeguards can provide

100 per cent protection against error or treachery. Nevertheless, the risks involved in the process of disarmament must be balanced against the risks involved in the continuance of the arms race.

- (9) It is arguable whether the arms race is the cause or the result of distrust between nations. But it is clear that the problems of disarmament and international confidence are closely linked. Therefore, while striving for the abolition of armaments, all nations must actively endeavour to reduce tension by helping to remove other causes of friction and suspicion.

Copy of a letter from the European Federation Against Nuclear Arms (Office: München 15, Schwanthalerstr. 64) to the Representative of the U. S. A. (United Kingdom) at the Geneva Test Ban Conference, Arthur Dean (Sir David Ormsby-Gore)

München, 16.6.1961

Dear Sir, -

The European Federation Against Nuclear Arms, concerned about the development of the Geneva Test Ban Conference and conscious of its duty to voice the aspirations of all nations toward an effective ban of the nuclear terror, begs to submit the following proposal to the delegates of the three powers at Geneva:

1. As it is evident that the respective views of the Western and the USSR proposals in the question of the control commission 'administrator' cannot be reconciled, it is necessary to find a new road leading beyond the solutions hitherto proposed.

2. The incompatibility of the respective views is caused by political reservations made by both the Western and the USSR representatives.

3. In view of such reservations, the conference will have to discuss a procedure of selecting such an administration which transcends such reservations.

4. The European Federation Against Nuclear Arms proposes, therefore, to discuss the following motion:

"The administration of the control commission for the inspection of possible nuclear explosions shall be elected by the Pugwash Conference, viz. from the ranks of its regular participants."

We believe that our proposal, aimed at overcoming the present obstacles of the conference, corresponds closely to the realities of our situation and the simplest aspirations of mankind. The danger resulting from a continuation of nuclear tests is not primarily political, and their control, therefore, should not be reserved to political forces alone.

Conscious of this fact, the great powers, despite the existing conflict, have permitted those regular meetings of scientists which are known under the name of the 'Pugwash Conferences.' It is only logical to extend the functions of these conferences and to delegate to them some of the control functions which, under the existing conditions,

could not be fulfilled satisfactorily by political gremiums.

In conclusion, permit us to state that the record of the Geneva Test Ban Conference up to this moment has not been such as to mitigate the very real, if silent anger of the nations against their leaders; an anger which was generated by the dilemma of nuclear armaments. We believe that the discussion, viz. the acceptance of our proposal would serve to counteract this anger and to rest at least partially the sorely tried confidence of the peoples in the good will of their governments.

A copy of this letter and an invitation of the European Federation Against Nuclear Arms to the participants of the Pugwash-Conferences to discuss our proposal will be dispatched simultaneously with this communication.

We remain, dear Sir, respectfully yours,

(Christian Mayer-Amery)
-Secretary-

(Heinrich Buchbinder)
-Acting President-

THE NATURE OF A DEMILITARIZED WORLD

Walter Millis

1. The Significance of the Question

Commenting recently on a panel discussion by a number of those who took part in last year's Moscow "Pugwash" Conference, David Riesman noted "a very strong sense in members of the panel that a disarmed world would look very different from ours, and that neither American nor Soviet participants had seriously thought about how to make such a world tolerable and reasonably safe." That a demilitarized international system would look very different from the existing one seems obvious; but that it might not appear to anyone as tolerable or even reasonably safe may seem a rather startlingly new idea.

Yet it can be said that there is nothing new about it--that this is the rock on which all proposals for the control, reduction or elimination of armaments have foundered, since the original proposal of the Imperial Russian Government in 1898 which initiated the modern history of disarmament. It has never been possible to devise a disarmament plan which looked safe, or even tolerable, to all nations concerned in terms of their military security, power and prestige. Jules Moch has given as his first "constant" of disarmament policy the principle that "any disarmament agreement, partial or general, must be approved unanimously by the states concerned. This requires that the treaty should at each stage increase the security of others." No persuasive draft of such a treaty has ever been devised. No proposal in this area has ever convincingly demonstrated that all would be better off by its acceptance than by its rejection.

The introduction of the missile-borne nuclear arsenals has provided us with reasons, more powerful than ever before existed, for fearing the future if the world is not demilitarized. But so far, no one has provided reasons for accepting demilitarization. The official Soviet position calls for "general and complete disarmament" within a brief period of years; the official Western position, while hesitating over the means, accepts the same end as its ultimate goal. It seems clear that if either set of proposals were adopted and put into effect in good faith, the result would be a very drastic transformation of international relations. But what would the new system look like, how would it work, in what way would it deal with the problems of both power and security? Neither set of proposals offers much if any clue to this question; neither, patently, can as it stands dispel the fears which it immediately engenders in the other side.

Neither offers any kind of useful blueprint of the international system which would be produced by its acceptance. But if there is any hope whatever of progress toward general disarmament, blueprints of this kind have become essential. We have developed a pretty persuasive--and appalling--picture of what will happen if the nuclear arms race is continued unchecked; we have developed almost no picture at all of what would happen if it were abandoned by common consent. In general, we tend either to dismiss such a possibility as utterly Utopian, or to assume that once it were realized all problems would be at an end and all could live in safety and security thereafter. Neither position is well founded. The missile-megaton arsenals have brought the demilitarized world much closer than is the Island of Utopia; but in doing so have magnified rather than diminished many of the problems it would present. There is a case for a demilitarized world, but so far no one has made it. Yet if there is to be any real progress down the road toward disarmament that case must be made and made persuasively. It is a very difficult question to deal with. But its significance to the problem of disarmament is paramount.

2. Two Avenues of Approach

There appear to be at least two ways of getting at the matter. In the first place, one can simply assume that the demilitarization has taken place; that all the military peoples have agreed that organized war is an outmoded institution and have in fact divested themselves of their military systems, including (as the Soviet proposal of June, 1960, puts it) their "war ministries, general staffs and . . . funds for military purposes." One can then try to imagine the resultant situation. A model constructed in this way will have considerable intellectual utility. It will enable one to separate the war factor from the totality of international relations, to see the war system in the round as a cultural mode or behavioral pattern, to see how many of our current troubles are the systemic consequences of these patterns rather than inherent in the nature of man or the necessities of social organization. Such a model will, in general, be optimistic and not without value. It will emphasize the fact that in the modern international organization there are no factors which require the great social groupings to shred each other with high explosive or incinerate each other in the thermonuclear fires. It will demonstrate that the world could get along without the war system a good deal better than it is now getting along with it.

But the method has its obvious limitations. The model, however attractive, is of course completely unrealistic under present conditions. The initial assumption, that the Soviet plan or its equivalent has been accepted and put into force, implies the further assumption that military considerations have ceased to be of interest to the

world's governments; that the governments have concluded that organized war is of no practical use to them, and has thereby become humanly "impossible." No people and no government has come anywhere near such a conclusion today. In his special message on defense, President Kennedy said, accurately and sincerely, that "the basic problems facing the world today are not susceptible to a military solution." His predecessor had declared that there is no longer "any alternative to peace." But neither of these sentiments was intended to imply that the United States would or could divest itself of its military establishment. If war no longer offers a practical "alternative" to peace, peace seems to very few to offer a practical "alternative" to maintaining the war system. The necessary initial assumption that the war system has been abandoned makes the model inapplicable to present problems. The model tends, as do other models of permanent peace systems, to meet its difficulties by assuming them away to begin with. However useful it may be in setting the stage, so to speak, something of more immediate relevance is required to affect the action.

A second approach may be made by asking, not how a warless world could be expected to operate, but how it may or might be attained. What are the essential obstacles? What is required to overcome them? What are the ineluctable "constraints" within which demilitarization can alone take place, those "constants," as Jules Moch put it, which define the problem? For useful discussion, one must here somewhat narrow the question. Many--probably most who have thought about it at all--believe that a demilitarized world is ultimately inevitable. But its nature will clearly be determined by the means through which it is established. The really passionate argument is not over the end result but over the means to its attainment. In 1860 probably most thoughtful Americans, North and South, believed that the abolition of Negro chattel slavery was ultimately inevitable. Our greatest, and relatively most deadly, quarrel was fought, not over the distant end, but over the means.

If discussion of a demilitarized world is to be fruitful one must, it is submitted, rule out notions of the inevitability of the triumph of either Communism or anti-Communism. One may retain one's private beliefs as to the certainty of one or the other of these outcomes, but it is difficult to see how there can be much useful discussion unless all are willing to contemplate the possibility that, arguendo, neither will occur. "Co-existence" of Communist, democratic and the many intermediate forms of state--must be accepted, not merely as a temporary expedient leading to an inevitable global triumph of one form or another, but as a theoretically at least possible condition. The question then becomes: What are the conditions or requirements which must be fulfilled to lead to an international system which, while demilitarized, does not necessarily produce the triumph of any specific

system, but leaves it open to men to shape their political destiny as their needs and aspirations may dictate?

The second approach appears to be necessary as a corrective to the obvious limitations of the first, though the first is useful as opening possibilities which the second, alone, might not reveal. The first may be said to present the problem of peace by assumption; the second, the problem of peace by evolution. Both will be pursued in this paper.

3. Peace by Assumption

Here the first difficulty is that just suggested: The assumption that "peace has broken out" raises quite different notions in Communist and in Western political thought. In Communist theory, war is exclusively the consequence of the "contradictions" within Western capitalist society or of the efforts, to which these lead, to suppress the socialist revolution, which must in any event ultimately triumph everywhere. When all states have acquired a thoroughgoing socialist organization, the causes of war will have disappeared. To assume that peace has broken out is therefore to assume that socialism has everywhere triumphed.

In Western thought, the causes of war are far less simple. They are to be found in the conflicts of interest and policy between armed, independent sovereignties, which may occur regardless of the internal organizations of the respective states. The outbreak of peace does not imply the elimination of conflicts of interest and policy, but rather an agreement that such conflicts should be resolved always by non-military means within a framework of law. The Communist concept of peace implies the generalization throughout the globe of the systems and methods which appear at present to have eliminated the possibility of organized war within that one-third of the human race which today constitutes the Communist community. The Western concept of peace similarly involves the generalization throughout the globe of the systems and methods which appear to have eliminated organized war not only within the great, integrated Western nations but within the Atlantic World as a whole.

Today, a repetition of the American Civil War seems impossible, not because we have eliminated passionate conflicts of interest and purpose from our society, but because we have confined them within a legal system (supported by the Federal "monopoly of force") which compels their resolution by non-military, and nearly always non-violent, means. This system has been, in effect, expanded through the Atlantic world. There is no legally authorized monopoly of force, but something like its equivalent has been supplied by the combination of the Communist threat from without and

the overriding American military predominance within. National issues, some of a rather grave kind, still arise within the Atlantic world, but they are adjusted normally either by applying commonly accepted standards of law and justice (the fisheries dispute between Britain and Iceland is an example) or by a basic sense of community of interest. Within the Atlantic world as a whole we have developed a going system of essentially legal or quasi-legal institutions which seem to make it almost inconceivable that there could be an important war between any members of the NATO alliance or their partners, in Latin-America and elsewhere--despite the wide variety of social and governmental systems included, one of which, Yugoslavia, being avowedly Communist.

To Western thought, the Communist picture of a warless world seems fantastically at variance with all the lessons of history and experience. How can the universal socialization of the means of production under a series of proletarian dictatorships in itself remove the causes of conflict between the great social groupings--causes which, from the dawn of history, have always eventuated in great wars? But to a sincere Communist the Western picture of the warless world must seem equally fantastic. How, he may ask, can anyone expect an effective system of law to be developed for a global society which still contains the capitalistic and exploitative elements which have, he holds, invariably led to war in the past? The image of a warless world held by each side seems utterly unrealistic to the other; and it is clear that this circumstance enormously intensifies the difficulty of attaining a general pacification. But so long as one is interested only in the results of pacification (not its attainment) the issue and the arguments it suggests may be deferred. The discrepancy between the two prophetic pictures is drastic. But their similarities are hardly less striking.

Each prediction foresees an international society composed of about a hundred legally sovereign states, ranging from the very great to the very small. In both prophecies, each of these states would be provided with lightly-armed police forces, capable of establishing the domestic "monopoly of force," of keeping domestic order, of controlling its frontiers and ports against smuggling, unauthorized immigration and border forays. None, initially, would be capable of levying serious war upon a neighbor's territory; none could export war far over national boundaries by the use of air, sea or missile power. And in both predictions there would be some kind of international police force competent to insure that no nation expanded its domestic police into a military threat against the territory of any other. This force would have to be under genuinely international control; it could not be controlled by a single state or any exclusive group of states. The two predictions do not differ until they reach the final clause. In the one, this multi-national global society

would be held together by common principles of socio-economic organization; in the other, it would be held together by commonly accepted principles of law.

This critical distinction should perhaps be clarified. Obviously no global organization could function without law. The successful socialist dictatorships, or peoples' democracies, require a great deal of law, and have highly developed legal systems. It might be said that there is as much law in the Communist prediction as in the Western. The difference is that in the Communist prediction the laws will enforce patterns of social and economic behavior which will eliminate any causes for international difference or dispute. In the Western prediction, the social and economic behavior may differ widely and may be expected to give rise to national differences and dispute, but the law will insist that these disputes be resolved by non-military and so far as possible non-violent means. While this difference is, as has been suggested, of first importance in the problem of achieving the demilitarized world, it is much less significant to the problem of how such a world, once achieved, would operate. In fact, whether one takes the Communist prediction, the Western prediction or a kind of combination--in which there would be enough socio-economic law to avert the wars of the past and enough political law (of non-military settlement) to avert the wars of the future, in a world containing socialist dictatorships, democracies and the intermediate forms--the resultant global system will seem to have very considerable strengths.

Under any one of the three, the military threat will initially be eliminated. This will eliminate what has been overwhelmingly the pre-occupation of diplomacy and international statecraft since the beginning of the modern era. Nine-tenths or more of international relations have revolved around problems of securing strategic alliances and strategic positions, of insuring military security against the military threats of others, of gaining defensible frontiers. One cannot look at any study of the relations of the European great powers from the last half of the 19th Century without realizing that these were essentially struggles for military defense or security, and the military prestige that was thought to support it, much more than struggles for economic gain or aggressive political goals. If the military threat to the established world order were removed (as under the present hypothesis it will have been) the whole international system becomes much more manageable.

In a world demilitarized by common consent the strategic factor would be absent. It is no longer of consequence as between the states of the American Union; it is no longer of any real consequence as between the nations of the Western Hemisphere. They are all independent sovereignties, without a specific international

police force controlling them and with no more than the existing international organs--such as the UN, the World Court or the Organization of American States--to declare a rule of law in their relations. They appear substantially to have accepted the territorial boundaries shaped by history; they do not engage in intra-American arms races; their military establishments do not plan wars of offense or defense, and are in fact little more than national police forces of the kind contemplated in both predictions for the demilitarized world. Although aggressive invasions have taken place over both the United States-Canadian frontier and the United States-Mexican frontier, the former has remained demilitarized since 1817 and the latter has never been fortified. Few other Western Hemisphere frontiers are formally defended.

This situation has developed gradually, for complex reasons which might not operate to create a similar situation in the world as a whole. But if a global situation of the kind could be established, the Western Hemisphere experience speaks rather strongly for its probable stability. The military stability of the Hemisphere may not endure, and the action of the Communist countries in re-arming the Castro revolution in Cuba with heavy weapons cannot fail to raise doubts. But even with Cuba brought to a high level of military power relative to the other Latin countries, it is not clear that this will necessarily upset the equilibrium. This is because the balance is not a military balance at all. It does not rest upon any nice adjustment of the various countries' provision for their military security, but upon a general, if tacit, agreement that military means are no longer important, useful or even applicable to the maintenance of the security of the several national communities. The Western Hemisphere system is one in which military considerations are no longer in fact dominant in national planning and inter-American policy relations.

The United States has in the past fought several wars within the Hemisphere and has frequently intervened with armed force upon the territory of its neighbors. For a long time this has ceased to seem a practical method of exerting its influence, and alternatives have been explored from the days of "dollar diplomacy" down through those of the "good neighbor policy" to those of the Organization of American States. When the Cuban problem reached critical proportions, the United States was careful not to threaten intervention with its own armed forces, partly, perhaps because of its international commitments, but much more obviously because it was impossible that any national purpose could thereby be achieved. It resorted to its experiment in "indirect" intervention through the Cuban refugees; the experiment was a disastrous fiasco, but has still opened no possibility of successful overt military action or created any real pressure to resort to it.

In a recent paper T. C. Schelling argues, no doubt correctly, that total disarmament cannot render war "impossible." Weaponry of some kind will always be available (he rightly reminds us that war with even primitive weapons can be very horrible, as the Thirty Years War demonstrated) and escalation always possible. He grants that "a disarmed world may be one in which motives, fears, temptations, traditions and political relationships are such that military and strategic relationships play less of a role than today." But he then goes on to consider the disarmed world in strategic terms, basically upon the assumption that these "motives, fears, temptations" remain unaltered. It is not surprising that his results are in general negative. The hope of those interested in a demilitarized world is not that it will render war "impossible," but that it will render it useless--or at best, demonstrate an inutility which it has already achieved.

Schelling observes that it can be held that "total disarmament can be achieved only in a world in which military force has ceased to be much relied on." The statement is hardly open to question. But this would be the situation in a demilitarized world. The incentives--or assumed incentives--which today make it seemingly so impossible to devise any acceptable system of general disarmament would be reversed. In a demilitarized world, for any nation to resort again to the war system, to re-start the processes of competitive armaments and war, would be pointless. Little or nothing could be gained thereby; a great deal could be lost. Alternative means would be available for deciding such power issues as remained; while the application of organized military force would be largely useless in furthering any real interest of the government contemplating it. The costs, on the other hand, would be severe. Not only would a return to the war system by one mean a return by everyone else; the domestic economic cost of restarting a great war industry would be heavy while the international political costs might be destructive.

This last statement is not based on any undue confidence in the police power of "world opinion." It is based rather on a consideration of the practical political strategy (in which "world opinion" might be one factor) which the potential violator would have to devise. One reason, at least, why the United States did not resort to atomic war on China at the time of the Chinese intervention in Korea was the obvious fact that the slaughter of millions of Chinese civilians would have accomplished no American purpose, but would have destroyed American influence throughout the world.

One may take another example. Among Americans interested in disarmament problems one often hears the argument that as disarmament approaches totality the inspection system must be made correspondingly rigid and complete. The thought here is that in a

disarmament agreement reducing American and Soviet nuclear stockpiles to a certain fixed megatonnage, a violation of five or ten per cent by either side would not make much difference; but if the agreement were for the total abolition of all nuclear weapons, then even a few megatons clandestinely held out by one side would give it an overwhelming advantage over the other. When interest served, the violator would merely have to deploy the threat of his clandestine arsenal, and the world would be at his command. It follows that as disarmament approaches its low limit, inspection must become correspondingly thorough and rigorous. Laxities or slippages which would be allowable at a comparatively high level of armaments are wholly unacceptable as one nears total divestiture of weapons.

As long as one persists in regarding the problem of the demilitarized world as a military problem, the argument seems unanswerable. But it neglects the consequences that would be produced by the demilitarizing process itself. If, in a world demilitarized by common consent, one party did hold out a clandestine nuclear arsenal--even if he managed (which would not be easy or probable) to conceal a command and delivery system adequate to back up any threats which he wished to make with it--would the instrument be of any practical use to him? Would his nuclear threats not be as empty, and as disastrous to his own interests, as was the threat of United States atomic weapons against China in the Korean and Indo-Chinese episodes? If the intended victim simply refused to pay any attention to it (as did the Chinese during that era) could he actually launch his weapons? If he did, could he accomplish anything except his own destruction thereby? The truth would seem to be that as the world approaches total demilitarization, the practical political risks of violation become greater; the advantages of violation become less. A climate has been created in which military considerations are in fact of diminishing importance--as they are in the Western Hemisphere today--and inspection systems, while no doubt still necessary, could decline to little more than a precautionary formality--rather like inspection and accounting systems in the modern corporate and financial world. These will not inevitably reveal embezzlement, which of course continues to recur, but they are sufficient to maintain the general level of confidence which renders those embezzlements which do occur of minor significance.

The last formal, organized international war within the Western Hemisphere was the Chaco War of the '30's. There has been no lack of violence within the Hemisphere since then, but increasingly it has taken the form of revolution, guerilla war or mob riots. Where the sovereign states have meddled in each other's affairs, they have been increasingly tending to do so through "indirect aggressions," through support of one or another faction within the

"target" state, through propaganda, gun-running and subversion. The United States, which intervened in Cuba in 1898 with a full-dress military invasion, has been unable to see how a repetition of that process could possibly resolve any of the problems by which we are confronted in Cuba today. Sixty years ago the American military forces were welcomed as liberators by a majority of the Cuban and Puerto Rican peoples. They would hardly be so welcomed in Cuba now. The psychological and emotional foundations for an operation on the 1898 pattern simply do not now exist; the international context in which it would have to be set is totally different, and it would be useless to attempt it. In regard to Cuba, war has lost its meaning for the United States.

It seems similarly to have lost meaning in the power relations of the states throughout the world. As has been said, organized international war within either the Atlantic world or the areas of Communist empire seems almost inconceivable at present. Along the unstable frontiers where the two great international systems meet, there are many difficult situations; and over almost every one the cry is usually raised that it carries a threat of major war. Actually, these cries are mostly propaganda; with one, or perhaps two, ominous exceptions it is very difficult to see anywhere in the world today a genuine and serious threat of all-out war. One is Berlin; the inappeasable Arab-Israeli conflict may be a second. For the rest, in Africa, the Middle East, Southeast Asia, the Pacific littoral, where the great military states vie with each other to advance or defend their power, they do so by "indirect" means. They may supply weapons, economic support, technicians, and even "volunteers" to the contending factions in such areas. They do not deploy their own armed forces, partly out of fear of the great war, but mainly because military invasion has become obsolete as a solution for the power issues actually presented. In the highly militarized world of today, organized international wars, even such as might successfully be kept "limited," are largely futile as instruments of policy. In a world demilitarized to police-force level a return to the general war system would seem even more futile; but the light weapons, as well as the economic and propaganda instrumentalities which are applicable to modern power issues, would still be available.

One may now recapitulate the image of "peace by assumption." The international system would be composed of substantially the existing independent sovereignties--large and small, wealthy and underdeveloped, stable and unstable. Forms of government would be of all kinds, from Communist proletarian dictatorship through non-Communist radical or conservative dictatorship, to constitutional authoritarianism to constitutional democracy. The economics would range from total state ownership through the various "mixed" forms, though all would be highly bureaucratized. In all there would be elite classes or groups,

bending the instruments of government to the maintenance of their own power and prestige; in none would "the people" be wholly voiceless or enslaved; in none, on the other hand, would the people have more than an indirect participation in the decisions of the bureaucracy, although in some, of course, this popular participation would be much more extensive than in others. The critical point here, it is believed, is neither the degree of popular participation nor the ownership of the means of production. It is in the common bureaucratic organization. While bureaucracies commonly wage titanic struggles within and against each other, they do so normally by non-violent means; they are, indeed, the principal instruments developed in contemporary life for reconciling the endless clashes of interest and judgment arising out of the developing technical complexity of our times. Two rival national bureaucracies can resolve differences between them far more efficiently and fairly than can two rival military systems--and it is believed that this is just as true when one is "Communist" and the other "capitalist" as when both wear the same ideological tag.

As a consequence of the assumption, all of these states would have renounced the use of war as an instrument of policy. All would be committed to the principle that no further territorial, political or social change could take place except as such changes could be effected by non-military and if possible non-violent action. Most of the states would be quite highly organized domestically. All would be living behind well-stabilized frontiers. (This, also, is a consequence of the assumption, though it should be noted that most national frontiers are well-stabilized today.) All would have divested themselves, not only of their heavy weapons but of their military formations, ~~their~~ staffs, war ministries and war industries. In the result, all would be relieved of any immediate military threat and those strategic considerations by which we are now so deeply pre-occupied would become largely irrelevant, as they have become within the Atlantic world. They would have an international police and inspection force of some kind, not primarily to "keep order"--since the order declared and established by the act of demilitarization would largely keep itself--but to warn the states, at the very least, against any tendency on the part of their neighbors to rearm. Even if one or another great state had held out a clandestine military establishment it would, in such a world, be an instrument of no use to it. Every state would have its own national police force to guarantee its internal "monopoly of force." With the abolition of military missiles, aircraft and war vessels, no state would have any reason to fear non-contiguous enemies; while there would be powerful political and legal considerations to protect smaller states against the misuse of their police forces by their great neighbors. There would be, presumably, a considerable further development of international law to deal with such justiciable issues as might arise.

But the non-justiciable issues would remain. These are those issues of power which lie beyond the scope of an agreed and commonly-accepted structure of law; and it seems improbable that a world containing both Communist and non-Communist, dictatorial and democratic, states can generate a commonly-accepted system of law broad and strong enough to deal with the power issues likely to arise. If the nations no longer felt that they had to fight for their military security, they would doubtless still feel that they had to contest for power. "Power" is a difficult and elusive word in this context. Power has many shapes. There is moral, political, economic, legal and police power, as well as purely military power. If the latter were eliminated from the "power struggle" just what would remain? This is the really critical question about the assumed demilitarized world--a question which neither Western nor Communist political thought seems fairly to have faced. In general, the West has gone no farther than to posit a world in which the power struggle would be legally confined within non-military means of settlement, and would therefore redound (it is supposed) to the conservation of the existing international system and the West's predominant position within it. Soviet thought, on the other hand, seems to have gone no farther than to posit a world in which the power struggle would be legally confined within those means of settlement (violent or non-violent) which would ensure the universal triumph of socialist proletarian dictatorship. The legal structure of this world will be such as to prohibit any violence opposed to this end and to permit any violence necessary to attain it.

The objective has been repeatedly stated by all Communist leaders from Lenin to Khrushchev. It appears very clearly in the Soviet disarmament proposals of June, 1960. Considering the measures to be taken "to insure peace and maintain international law and order . . . under conditions of general and complete disarmament," the proposal suggests an undertaking by the states to place detachments of their national police at the disposal of the UN Security Council to form an international police force. It then adds: "Naturally, such police--militia--detachments should be used exclusively for maintaining peace among nations and not for suppressing peoples who are struggling for their independence and social progress, and not for interfering in the internal affairs of states." This would authorize any violent revolutions or seizures of power of, for example, the Castro type. It would not forbid the great states from supporting them from outside with money, propaganda or light arms. It would prevent any international police action to control such situations (as an interference in internal affairs); and while it would debar the threat of organized war by a great power in support of its own faction, it would seem to leave virtually unaffected the present Soviet and Chinese power to promote such operations in the Communist interest. Communist political theory

has reason for anticipating that the result would be the universal victory of populist dictatorial socialism. It is for this reason that many in the West accept the Soviet proposals for general and complete disarmament as basically sincere. Advanced as they were at a time when there was obviously no possibility of their acceptance by the West, they must have had a large propagandist content; but there is every reason to believe that the Soviet Union would be glad to settle on such terms. What is in question here is not the sincerity of the proposals but their common sense.

"Peace by assumption" presupposes a universal agreement upon the desirability of the world system which would result. It is simple folly for either the Western or the Communist world to imagine that it is possible to get a consent agreement to any system which promises the inevitable destruction of one side or the other. But one is led to look again at the assumed state of demilitarization. There are flaws in the Communist expectation just as there are, no doubt, in the expectations of the West. General demilitarization would seem, at least at first sight, to give an advantage to the Communist technique of indirect support for local populist revolution in the underdeveloped and unstable areas of the world. It would confer no corresponding advantage upon Russia in the great and stable Western democratic societies, where Communism has largely lost any operative significance. In the demilitarized world, the Russians must certainly expect a large, hard core of capitalist democracy, with great political and economic power, to remain; just as the West must reconcile itself to the permanent continuance of the great and stabilized Communist societies.

If the power struggle continues in the "uncommitted" areas, some things would soon become rather more apparent than they seem to be today. The spread of dictatorial socialism, even when it is directly supported from Moscow, is by no means the same thing as the spread of Russian Communist power. At the time of writing, Nasser is engaged in a violent propaganda battle with the Soviet Union. Recent history is strewn with figures from Tito or even Mao to Castro or Touré in Guinea who, while operating socialist or populist dictatorships and accepting Russian support, are far from being Russian puppets. The abortive invasion of Cuba, while seemingly consolidating Castro's position beyond any chance of his overthrow, has at least tended to weaken his subservience to Moscow. It may well be that populist dictatorial socialism will prove the only visible answer in the more chaotic or more backward areas of the world. If so, it may take the military form (as in Egypt or now, apparently, in Korea) as well as the explicitly Communist form; even in the latter case it will not necessarily represent an expansion of Russian political power, and even less will it be equivalent to the "Communist conquest of the world."

It is often said that the Russian and Chinese leaders are bestriding the world because of their dedicated, unremitting

"purpose" is, has no corresponding historic conviction and cannot make its gospel effective in the "battle for men's minds." One must look with some suspicion on this analysis. It is true that Marxist predestination and the Communist slogans built upon it provide powerful weapons in the struggles of radical leaders like Castro toward dictatorial power; it is probably also true that the Western slogans of freedom and democracy cannot be made effective in those large areas of the globe where democracy appears to be unworkable and "freedom" only too often carries the connotation of freedom for small elite groups--both native and representative of foreign capital--to preserve their own profits and prestige at the expense of much needed social and economic reform for the mass of the population. While the Communist slogans are often illusory, they cannot be combatted by Western-democratic slogans which in the given conditions are likely to be more so. But the battle of slogans is by no means the same thing as the battle of power. The real question is not the comparative fighting value of the slogans; it is whether a working international political system can be constructed out of the non-military factors now available. Such a system must allow for the inevitable power conflicts in the world; it cannot be so constructed as to foreclose their outcome in either one sense or another; it must provide a fluid co-existence for many contrasting forms of government, and must probably allow for a fair amount of violence. But it must exclude the appeal to organized international war as the final arbiter in its affairs.

With demilitarization, the West could face such an international system with considerable confidence. It has not remained helpless in face of the rise of dictatorial popular socialism. The West is neither as ruthless nor, perhaps, as skillful as the Soviet and Chinese Communist leaders in exploiting the issues which this raises; while the West still carries a weight of 19th Century liberal tradition which makes it extraordinarily difficult for it to understand the implications of the bureaucratized, populist political economy which seems to be typical of the modern era. But its lack of doctrinaire ruthlessness is an asset as well as liability in the world power structure; while its understanding and its techniques (in spite of the Cuban fiasco) have been steadily improving.

Ideologically, the democratic West has been puzzled and embarrassed by the appearance of anti-Communist military dictatorship (the most recent represented by the military coup in Korea) in its "camp," but in practice it has seemed quite capable of accommodating itself to such developments in the Soviet-Western power structure. The foreign aid programs of the United States, the Point four and now the Peace Corps operations, the willingness to abandon, almost without protest and wholly without military threats, the extensive American private and public investments in Cuba, all

indicate a new grasp of the realities in the world in which we are now living. The West is not unprepared to deal with them. Relieved, through a general demilitarization, of the Soviet military threat, the United States could have met the problem of social revolution in Cuba far more intelligently than it did. The social and economic problems in the "Pearl of the Antilles" were not basically different from those which the United States has in fact met with marked success in Puerto Rico. The structural similarities between the proto-Communist Castro regime in Cuba and the military, but fundamentally populist, Trujillo regime in the Dominican Republic were so strong that many looked to a possible coalition between the two. The United States was unhappy, for different reasons, about both. A clearer view of the real social and political forces at large in the world today might have made it possible for the United States to manage its relations with both to more constructive ends.

The old, conventional patterns of international life and policy are breaking up; they have been fractured, first, by the military consequences of the nuclear arsenals and second, by the social and economic consequences of the new bureaucratized technology. New patterns of international relations are developing in which organized war is not now a prominent factor and may never so become. If war and the war system were abolished, the capitalist-democratic West could face the resultant situation with quite as much confidence in its political, economic and moral power as any Communist could muster. The question which the West is forced to put to its Communist opposite numbers is whether Communism could do so? In a demilitarized world, the specialized Communist technique of supporting, if not actively fomenting, dictatorial social revolution in non-Communist countries might well be turned against the great Communist states themselves. This is what the Soviet Union alleged occurred at the time of the Hungarian revolt. But it was clear then that, whether or not there was any substance in the charge of Western "imperialist" incitation, the fear of precipitating a great war prevented any practical exploitation of the situation by the West. In a demilitarized world there would be no fear of a great war. How, one is forced to ask, do the authors of the Soviet general disarmament plan envisage a repetition of the Hungarian situation?

In the Hungarian case, the rebels overpowered or subverted the local police forces (including Russian as well as Hungarian units), and the Soviet Union restored the situation by invading with the Red Army. Under the Soviet plan for demilitarization there would be no Red Army. The proposed international police force would be expressly debarred from intervening in a "domestic" issue of this kind. The Soviet Union's national police force would, naturally, be very much larger than Hungary's; in organization and equipment it would be

ill-suited to a military invasion, but it would presumably be physically capable of over-running the neighbor state and "restoring order." Nor would the international police (if composed and commanded in accordance with the Soviet plan) be competent to prevent it. Would the Soviet Union launch a "police" invasion of Hungary? To do so would be in flagrant violation of the treaty structure on which the demilitarized world rested; it would bring down that world--from which the Soviet Union like all others, would be deriving many benefits--in irretrievable ruin. Would she simply accept the results of the revolution, probably imperilling thereby the stability and internal security of the whole Russian Communist empire? Or would there ensue within Hungary a competition between East and West, using the "indirect" methods discussed above, of which the outcome would necessarily be left open?

These are not empty questions; it is essential to have answers for them if one is to form any picture of how a demilitarized international society would actually operate. The questions can, of course, be modified by assuming an international police force with more authority and power to intervene in Hungary-type situations than the Soviet proposals would allow to it--as well as a much more developed structure of international law and government than the Soviet Union appears to contemplate--but such an assumption would only beg the underlying power issues which would have to be met before such a force or such a government could be brought into being by common consent. Of the three possible Russian responses, in a demilitarized world, to another Hungary-type situation, the third seems to the present writer the most probable. But whether it seems the most probable to the Soviet proponents of general and complete disarmament we do not know.

There are other present or potential situations which the West may fairly ask Russian spokesmen to analyze. It is evident that today the Soviet Union and China do not always see eye to eye; but it is perhaps equally evident that in the existing military context a war between China and the USSR is a virtual impossibility. Each partner is too vital to the other's military security to contemplate an armed conflict between them--a situation much the same, indeed, as that which exists within the NATO community. In a demilitarized world a Sino-Soviet war would be equally out of the question, but how would such power issues as might arise between the partners be resolved? The Western nations can say with confidence that there will be no issues among themselves which will be insusceptible to resolution by non-military means. Can the members of the Communist bloc say the same?

So far, this paper has endeavored to project the kind of world which would be brought into existence by a universal agreement on

general and complete disarmament--the kind of world we would be living in if the Soviet plan or its equivalent had been adopted by all powers, carried out in good faith, military establishments demobilized and military industries converted to peaceful uses and at least a minimal international force set up to see that they remained so. The attempted projection raises a good many difficult issues, like those just discussed, as to the power structure of such a world, as to how power relationships would be regulated and power issues received. These issues demand much more careful thought and study than has been given them. But the projection is on the whole optimistic. Initially, the peoples (and their governing groups) would be relieved of the fear of military aggression and the heavy pressures which this has always put upon them to achieve military security, military power and prestige. Territorial frontiers would be stabilized everywhere, as they now are within the Atlantic world, subject to change only by consent or by internal revolutionary processes. With their national police forces, the several governments--whether dictatorial, democratic or of intermediate form--would be confirmed in their internal "monopoly of force" which is the necessary attribute of all government; and while many international differences would doubtless continue to arise, few would be of a kind which would seem to any government possible of resolution by re-starting the processes of rearmament, military threat and war. It has been said over and over again that a pre-requisite to demilitarization is the development of an international legal and judicial system, with forcible sanctions, to compel the peaceful settlement of international "disputes." But it is almost never asked what such disputes would be or could be about, other than issues of the kind which are readily settled today by adjudication or negotiation.

In a world of this character, the incentives which today drive governments to armament races and war would be reversed. Today, it is taken as self-evident that violator of a disarmament agreement will thereby gain an overwhelming advantage at no cost to himself; and it is therefore felt necessary to devise inspection, control and international police measures of the most extreme rigor to prevent violation. In a world which had once been demilitarized, there would be no popular pressure for reviving the war system; while one may be fairly confident that among the great majority of leaders, dictators, policy-formulators, rearmament would hold out no attractions comparable to those of maintaining the demilitarized world.

Once successfully demilitarized, the world would have an inherent stability, in contrast with the inherent and apparently ineradicable instability of the contemporary militarized world. It is not to be supposed that armed violence could be excluded from this global system, any more than it has been excluded from even the most orderly of existing national systems. But where violence seemed inescapable in the interests of social or political change, it

would be confined to the methods of riot, mob violence, guerilla and civil wars, employing only the light, police-type weapons which would alone be available. If the great, stabilized powers felt it necessary to meddle in such affairs, they would do it at most by the "indirect" methods already discussed. A substantial degree of world order would be maintained, not by an overriding international military force nor by "world opinion" (an elusive and most unsatisfactory concept) but by a political situation which would make disorder unprofitable to any important wielder of world power.

The demilitarized world would not rely on a military stabilization. It could come into being only as military stability was seen to be unimportant; and it would have to take its chances with local disturbance and the power shifts incident upon them. But it would possess a stability rather like that which we now see operating in Latin America. The contemporary world, resting as it does upon a balance of terror, has often been said to be in a position only of "metastability," like that of a ball poised on the top of a hill, with only a slight displacement required to send it rolling to the bottom. The demilitarized world would, rather, resemble the situation of a ball at the bottom of a hollow, where even large displacements will result only its return to the original position.

Such is the promise of the demilitarized world. The modern bureaucratic nation state, in conjunction with the technology of which it is both the creature and the creator, is among the most remarkable inventions of man. Regardless of the particular ideologies which may inform it, its powers of organization and achievement are enormous. Once freed of the incubus of its strategic origins, its strategic obsessions and its strategic fears, it could finally become the greatest of all instruments in the perfection of the human lot, rather than the probable agent, as it now seems to be, of the annihilation of mankind. That is the promise of demilitarization. Performance is a different matter.

4. Peace by Evolution

In attempting to project the characteristics of a world pacified "by assumption," the foregoing section has omitted any discussion of most of the issues which are now being actively debated in this field. It has said nothing about the terms of the assumed disarmament treaty. It has said nothing about the development of an international legal and jurisprudential system--regarded by many as a prerequisite to disarmament. It has said nothing about the structure of the central international authority, and very little about the composition, the command and the functions of its

international police force. It has not discussed the complicated problems of inspection and control of armaments. It has raised only obliquely the very real issues involved in the remaining national police forces and their functions. It has said nothing about the technical economic problems of demobilizing the uniformed establishments and reconverting the war industries to pacific employment. It has not even discussed possible political solutions--particularly in Germany and Formosa--which obviously must be found before any general and complete disarmament by common consent can possibly take place.

These omissions were deliberate. All these topics concern, not the nature of a world demilitarized, but the means of attaining such a situation. The distinction is critical; and endless damaging confusion has been caused by the failure to observe it. It is too often argued that because a pacified world will be a disarmed world, disarmament is the best means to secure the pacified world. Decades of experience have indicated that there is a fallacy in this syllogism, yet it still persists in high places and low. The goal--a state of general disarmament and pacification--seems, once it has been attained, to be workable and desirable. But unless this image of the goal can be clearly distinguished from the discussion of the means to its attainment, it will be difficult to bring useful analysis to bear upon the many means which are currently proposed. The imagined future can at most throw a helpful, perhaps encouraging, light upon the issues of the dangerous and distressful present; but it cannot in itself resolve them.

It is the conviction of the present writer that most if not all the proposals offered as ways of attaining the warless world in fact describe the consequences of a general pacification rather than causes which will produce it. General disarmament, the development of the rule of law, of more effective world government, of improved global economic organization, will play only an ancillary role in the progress toward pacification and will in the end prove to be reflections of that progress rather than the generative forces behind it.

This is certainly the case with disarmament. The course of present negotiations, to say nothing of the whole previous history of the subject, combine to indicate that there is no purely military solution to the problem of peace. It seems safe to say that no significant disarmament treaty can be written so long as the parties are convinced that the preservation of their security through military means is the first requirement. It is apparently impossible to abolish war through any process which maximizes its importance in international affairs. In the United States it is often said that a complete and rigid inspection system is a prerequisite to creating

the confidence without which no disarmament agreement can be reached; yet it is plain that the insistence upon complete inspection only undermines what little confidence exists today. It is the paradox of the inspection problem (as, indeed, of the whole disarmament problem) that even the most elaborate and perfect of inspection systems is unlikely to work (much less to be acceptable) unless the question of whether it works or not is of little consequence. As between the Soviet Union and the West today there is actually a good deal of at least tacit limitation and control of armaments; while nations have frequently in the past reduced their military preparations, or halted or refused to enter upon arms races. But they have never done so through negotiatory processes which unavoidably concentrate the maximum attention upon arms, exaggerate their political and social importance and seek solutions for the dangers they present by trying to balance the military "securities" they are supposed to provide.

An ironic (and now probably forgotten) example of this effect occurred in the latter '20's, when the British and Americans were endeavoring to extend the Washington Treaty limitations on battleships to the smaller naval classes. The controversy which thereupon arose between them as to "big" as against "little" cruisers was totally irrelevant to the already developing international context. It had no significance to the real military security of either nation. But simply because a treaty was to be signed, because the negotiation focussed attention upon the naval types involved and because neither nation dared mortgage the future by a present commitment, the argument was hotly waged across the Atlantic--and was probably one of the most meaningless arguments in the history of international relations.

The present Western position on disarmament, unassailable as it may seem in logic, represents the pursuit of an illusion. Both the U.S. and the USSR are, officially at least, committed to general and complete disarmament within some comparatively brief period of time. To the West it seems obvious that this can only be attained by graduated steps, each fully controlled and inspected for compliance before the next is taken. The Soviet refusal to accept this view is commonly regarded by the American press as an indication that the "Russians do not want to disarm"; the American insistence upon control and inspection is no less regularly presented by Soviet sources as an indication of a similar recalcitrance on the part of "capitalistic warmongers." To neither side does it seem to occur that the real difficulty is not one of motive, but is due to the inherent complexities and psychological difficulties raised by any attempt to achieve peace by military means.

In the United States in the past few years more serious thought and study has been given to the disarmament problem than in any other

country. This labor has been really earnest and sincerely motivated by a desire for peace. But since it has all proceeded on the assumption that the first requirement of any disarmament plan must be the military security of the parties, the results have been almost wholly negative. Nearly all of this work sums up to a demonstration that nothing can be done--nothing, that is, which the Russians would accept; which on the fundamental principle that disarmament can proceed only by common agreement comes to virtually the same thing. The most for which any of these American students hold out any hope is "arms control," which means a better stabilization of existing military forces and weapons systems. It does not seem impossible that a good deal can be done toward "arms control"--more of it, probably, through tacit understanding than through formal treaty arrangements--but this is obviously no answer to the major problem of war in a world already too highly integrated for war to be an acceptable mode of politics.

The Russian position is really more logical than the Western, but it also represents the pursuit of illusion. Khrushchev stated it admirably in his report on his conversation with Kennedy:

In conditions of universal and complete disarmament, the question of international security will appear in a new light: There will be no armies and no danger of one state attacking another. Under these conditions, the Soviet Union will be ready to accept the Western powers' control proposals. We shall agree that provisions should be made for a control system without any restrictions by whatever side . . . And this is perfectly logical, because if there are no armies, no arms race, nations will have no military secrets, and then the Western nations will be able to enter any door, any plant or institute in our country just as our representatives will in their countries.

What this says, quite reasonably, is that the only way to abolish war is to abolish it. If there is a general agreement on dismantling the war system, details as to control and inspection will become manageable, in fact, unimportant. But without the general agreement as to abolishing the war system, the effort to accomplish such a result by a balancing of military securities, inspections and so on, is doomed to failure. This seems obviously true. But until Khrushchev can offer some practicable proposals for abolishing, not simply large armaments but the war system itself, he is in a world as unreal as that of Western statesmanship.

The West has found no purely military solution to the problems of war. But Russian thought has found no non-military solution to the

same problem. Khrushchev has offered no persuasive reason why the West should enter a treaty of demilitarization. The argument that in a demilitarized world Communism will inevitably "bury" the West may be strong, but it certainly cannot move the West to accept demilitarization. The Khrushchev view is as politically unrealistic as the Western view is militarily unrealistic. In the whole disarmament debate, neither side has grappled with the motives that might make disarmament proposals practical politics.

The only real motive operating today on either side is the fear of thermonuclear war, the inapplicability of such a war to the resolution of any human problems, and the doubt as to the possibility of conducting any significant war without sooner or later calling down the nuclear arsenals. These are, however, very strong motives; they have clearly dominated the course of international policy at least since the beginning of the Korean War in 1950, and may be expected to operate in the future. If the consequences of these fears are sufficiently effective, international politics may be modified into a system in which the demilitarization of the world becomes a political possibility. Otherwise, the civilized world will presumably destroy itself. If this outcome is to be averted, what modifications in our existing system must in fact take place?

For the reasons already discussed, it is believed impossible to provide any "plan" or program of modification which will hold out any hope of success. The modification must be regarded in terms, not of pre-constructed plan, but of process. One must look, not for a program (such, for example, as the establishment of world government and the "rule of law," or, for that matter, the universal triumph of Communism) but for a dynamic which will tend toward the desired end, employing such concepts as world law, or international policing or general disarmament only as they become useful to it. The energizing heart of such a dynamic must be found in the steadily growing realization of the inutility of major war. We put it now primarily in terms of the fear of nuclear weapons; yet this realization has in fact been growing since the tragic years of the First World War. As George Kennan has put it, by 1917 at least it was apparent to many and should have been apparent to all that war was no longer a practicable instrument of policy. It is true that a still greater war was to ensue; but both the publics and most of the statesmen of 1939 were very different from the publics and statesmen of 1914, and the publics and statesmen in the two great, potentially hostile military colossi of today are very different from those of Germany, France, and Britain in 1939. We have been learning, taught not only by the bombs but by the whole scale of experience in the past half century.

One might expect the first consequence of this experience to be manifested, not in a general disarmament treaty, but in a comparative stabilization of existing military systems--in some degree

of what American students now call "arms control." The tendency here will be to slow down the arms race. It is not now operating at anything like maximum possible pressures--as is illustrated by the essentially absurd contre-temps which has been arrived at over the nuclear test ban negotiations. There is every reason to believe that both the Khrushchev and the Kennedy administrations would be relieved if no further testing should take place. But neither dares bind itself to do what both want to do, for fear of being outwitted; so each tries to use the threat of restarting a process that neither wants to resume as a means of forcing the other to agree to its idea of how the process should be halted. This application of games theory to international policy has its very dangerous implications; but it is also grotesque, and the grotesquerie may ultimately overcome the gamesmen.

Another example of the relatively lowered pressures of the arms race is provided by the refusal of American opinion to enter with any seriousness into civil defense programs, and the apparent disinclination of the Soviet Government to do so either. There is a good deal of obscurity in the United States about the real extent and effectiveness of Soviet civil defense programming. Our impression is that while Russia has done a good deal more than the United States in the way of drills, indoctrination and so on, it has done little if anything more in the way of reliable defenses--vast fall-out shelters, stockpiling of resources, deep underground protection of industrial resources--than has the United States. Both countries, one may conclude, are much more interested in seeing that a thermonuclear war does not occur than in taking precautions against one. This means that both the arms race and war itself takes a secondary place in their calculations. The arms race is being carried on today at too high a pitch for safety, but it is not a maximum pitch. Neither of the great contestants really thinks that military power is everything. And this belief is more likely to grow than to diminish.

If it does grow, "arms control" should tend toward the second obvious prerequisite to general demilitarization. That is the effective stabilization of frontiers. It has already been observed that most of the world's frontiers are today well stabilized and generally accepted by those concerned. Perhaps only in Germany and in Formosa is the territorial question really acute. These are, certainly, large exceptions; and the danger of the civilized world blowing itself to pieces over them--especially over Berlin--is much too great for comfort. But both are subject to compromise; and as the military threats and military calculations which surround them can be reduced, by arms control or otherwise, compromise must become increasingly possible. In the case of Germany a wide range of compromise proposals has been advanced. In a demilitarized world almost any one of these would yield a reasonably just and stable solution. In the contemporary world of military power politics, they offer no practicable

basis for compromise because they do not reach to the strategic factors involved in the power issues.

It is the same difficulty as one encounters with disarmament proposals. If Khrushchev was right in saying that there is no possible compromise of the "inspection" problem unless the West is ready to forswear war, the West is certainly right in saying that there is no practicable compromise of the German problem unless the Soviet Union is equally ready to forswear war. So long as war and threats of war remain the final basis of the international system, the West cannot sacrifice Adenauer's Germany to Communist expansionism--as, indeed, Russia cannot sacrifice East Germany to Western expansionism. With complete demilitarization, on the other hand, the problem of the Germanies would be as readily negotiable as the problems of inspection. Any progress toward de-emphasizing the significance of military or strategic factors in the minds of responsible statesmen will bring compromise solutions that much nearer; and compromise solutions of remaining important territorial issues will in turn facilitate disarmament.

The old question--endlessly debated since First World War days--as to whether "political" solutions must come before disarmament or disarmament must come before political solutions, has never been answered, no doubt because it is essentially meaningless. Military and political factors are too deeply entangled in contemporary international politics to be susceptible to the kind of distinction; in neither can one find the key which will unlock the riddle of the other, since both are ultimately the same. Only in a changing international context can solutions increasingly be found in both areas, solutions in each reacting to encourage those in the other. It seems quite illusory to hope that a political settlement of the German Question adequate to resolve in itself the armaments problem can be drawn up, proposed and ratified today. It is less illusory than many may suppose to hope that the international context is changing and will continue to change to a point at which a politico-military resolution will become possible.

James Reston has shrewdly observed that the issues now actually being raised over Berlin are not really of a military character: "The talk of war, while it makes big headlines, makes very little sense." The Russians, he argues, are "really engaged in a clever non-military strategy to solidify their postwar gains." Khrushchev's governing objective is not the destruction of West Germany but the stabilization of the Communist empire in Eastern Europe; it is "obvious" that this cannot be done by precipitating a war over West Berlin, just as it is obvious to the West that West Berlin cannot be defended by a war. War is really useless to both sides, and both sides already know it. Just as the Russians are deploying a "non-military" strategy in this affair, there are non-military strategies open to the West; and there is a good possibility that

through the inter-play of these strategies the situation can ultimately be stabilized without a war. The great danger is, of course, that each side feels it necessary to back its "non-military strategy" with threats of war--threats which may easily be miscalculated by one side or the other. But both sides may also appraise the threats accurately (the penalties of miscalculation being altogether unacceptable to either) and a reasonably stable result be attained. Here the context of international relations in one critical area is in fact changing; if it changes sufficiently, we shall be that much nearer to a general stabilization of the world's frontiers, the elimination of territorial issues and the creation of a situation in which general disarmament will become a possibility.

If the control of the arms race is the first condition for pacification, and the stabilization of frontiers the second, a general acceptance of some form of international authority is presumably the third. This authority might, it is believed, be quite modest in the scope of its powers and armed forces, but it is hard to escape the conclusion that it would have to be genuinely international--or, better, supranational--in character. However limited its role, within the limits of that role it would have to operate free of veto by any nation state. It would have to be in fact an authority.

Since 1945 the Russians have insisted with great pertinacity upon the "unanimity" rule and its corresponding veto power; they are raising the question once more with their proposals to the UN Secretariat and arms inspection to a "troika" system. The West, too confident of its generally dominant position in existing international organs, has never taken the Russian argument with the seriousness which it deserves; but the Soviet Union itself seems never to have fairly faced its implications. The very idea of an international "authority" is somewhat more complex than either Russia or the West has admitted. Brute force can, of course, be exercised over anyone too weak to resist it; but an international authority--like authority of any kind--can operate only within a consensus which recognizes and accepts it. True authority can exist only in the framework of a general agreement that it is better, within the areas in which the authority is empowered to act, to have a decision of some kind, however adverse it may be to any particular interest involved, than no decision at all. To the extent to which the affected interests retain a veto power, there is no authority.

As a simple illustration, there is a general consensus in the United States that it is better to accept the decision of a majority of the Electoral College as to who shall be the next President, than for any candidate or his supporters to retain a veto power against an adverse decision. In the recent election, although one-half the voters would have preferred a different result, the decision itself was of too much value for any of the disappointed to demand a power of veto.

In this particular situation the authority of a majority of the Electoral College (which wields no physical power whatever and never even meets as a body) is unchallenged, because it operates within a consensus which accepts it.

The idea of an international authority raises the problem of securing the consensus on which it may rest. The Russians were well justified in their insistence upon and repeated use of the veto as a defense against the claims of a spurious consensus, where no real consensus existed. But they were mistaken if they supposed that a unanimity rule could generate such a consensus. Where the foundations for authority do not exist, a unanimity rule cannot create them; it can lead only to a deadlock rendering the development of consensus impossible.

In their bitter-end defense against the claims of a spurious consensus (often advanced by the West in the name of "world opinion," or majority votes in the UN, or "respect for treaty engagements") the Russians have made no positive effort to develop what minimums of international authority may be required to support a warless international order. They have repeatedly indicated the areas where they believe they must have the protection of the veto; they have never tried to explore possible areas in which they might be able to do without it. Unfortunately, it is not clear that the West has done much better in this respect; it clings to its own veto powers as jealously as do the Russians, and when it appeals to "world order" or "world law" it is still basically appealing for an anti-Communist consensus, which obviously cannot meet the problem. It is quite pointless to argue the question of culpability. If one is seriously addressing the possibility of "co-existence" in a world containing both powerful Communist and powerful democratic-capitalistic states, one cannot pause over these insoluble moralistic problems. The practical issue is clear, whatever one's moralistic views may be. "Peaceful co-existence" will require at least some supra-national authority. This cannot exist except under a consensus that its decisions (always within the areas in which it is empowered to act) are superior to any of the interests which they affect. They must, therefore, be veto free--just as are the decisions, for example, of the Russian Communist Party within the area of its competence.

No unanimity rule can produce such a consensus. There are no "neutrals" today who can clearly command it. It cannot be generated by any reshuffling of representational systems. A reconstruction of the UN General Assembly, for example, along the lines suggested by Clarke and Sohn might well compound the present confusion, but it could not produce the common consent to supra-national decisions which is essential. Khrushchev's "troika" can no more bear him to the universal triumph of Communism than a one-horse sled driven by a Hammerskjöld can carry the West to democratic world domination. The only possibility of advance appears to lie

along two avenues. One is in reducing the putative role of the supra-national authority to limits within which acceptance of its decisions becomes generally preferable to resisting or nullifying them. The other is in enlarging the areas within which national governments will be willing to accept supra-national authority. If these two processes or tendencies can be carried far enough to sustain a general demilitarization, the warless world will become a possibility. What is essential is not systems--of even the most ingenious kind. It is the consensus necessary to permit any systems to operate.

A consensus which will permit the establishment of a supra-national "world government"--analogous, for example, to the Federal Government of the United States--over all the various races, economic systems and political organizations of modern mankind seems totally beyond reach at present. On the other hand, we already have a general consensus that major war (especially with nuclear weaponry) is useless, anachronistic, and probably imperils the whole future of humanity. Is it possible to develop this consensus far enough to empower the minimum of supra-national authority required to sustain a demilitarized system? If it is, the design and manning of the supra-national agency should present no insuperable difficulties. The development of the UN Secretariat, composed of nationals of many countries under a "neutral" General Secretary, raised no serious problems until it was forced into activities reaching beyond the area where an effective consensus existed to support it.

There are not a few cooperative international operations in which the sovereign states have for convenience agreed to submit themselves to veto-free supra-national authority in one form or another--William O. Douglas gives an impressive list of them in "The Rule of Law in World Affairs." When these are suggested as possible models for a supra-national authority to control demilitarization, the usual answer is that they are practicable only when they deal with relatively unimportant issues. No sovereign state will commit its "vital" interests to supra-national authority. But the European Coal and Steel Community, operated by a supra-national "High Authority" whose decisions are appealable only to its supra-national Court of Justice, deals with matters of fairly vital interest to the member nations. Some of the other international authorities might also be cited. In such instances one is confronted by an existing and effective consensus that it is more "vital" to get a supra-national decision on the issues involved than it is to leave them, through some form of veto, to independent and chaotic determination by the separate states concerned.

Considering the appalling nature of the threat of war in a nuclear age, it does not seem impossible that a minimum consensus of this kind could develop in regard to the military relations of the states, as it has in regard to the economic relations of the European Coal and

Steel Community. The powers of the supra-national authority would not have to reach very far. As in the case of the European Coal and Steel Community, they certainly would not and could not reach to a power of life and death over any of the hundred-odd constituent nations or the varying political and economic systems they have developed. The supra-national authority would have to have sufficient veto-free power to police the execution of a general disarmament treaty, and to ensure that rearmament was not begun anywhere. It would presumably have to have a certain amount of armed force at its disposal, but its power would not normally be exercised by force of arms.

Within the concepts of international relations available to us today, it does not seem possible to create a supra-national authority empowered to coerce any of the great nation states. In the last analysis, if a treaty of general disarmament was violated, the damage could not be repaired by resort to war; just as it is now pretty well recognized that the undertaking in the UN Charter to settle all disputes by non-military means could not, in the event of violation, be repaired by resort to military means. The primary weapons of the authority would be inspection, intelligence, publicity and report. In a world prepared to disarm by common consent, these weapons should be sufficient in themselves to insure that the disarmament treaty was faithfully executed and to create the indispensable condition for its survival--that nothing could be gained through rearmament by any power comparable to the costs which rearmament would impose. Khrushchev has already said that once disarmament has been agreed to, Russia would accept any form of inspection and control for which the West might call. Would the Soviet Union be unwilling to accept a supra-national control authority on a veto-free basis? Since some authority--which means effective authority powerful within its limits--appears to be inescapable, if the Russian answer is in the negative there seems no hope of advance. But neither does there seem to be any clear reason why it should be in the negative.

A more difficult issue perhaps resides in the national police forces which, as has already been suggested, would obviously have to remain at the disposition of the national governments. There are many ways in which a national government might attempt to develop its police forces into an armed threat against neighboring states, or in which clandestine revolutionary forces within a state might attempt to create paramilitary forces against the wishes of the legal government. How far must the supra-national police force be empowered to intervene in such cases? Must it be so organized and weaponed as to be superior, in military strength, to any national police? If so, under what conditions could it be utilized?

The Soviet disarmament plan suggests that it could never be employed to intervene in any "domestic" issue, but only to keep the peace between nation states. This appears to raise a certain

contradiction. If it cannot intervene in domestic situations which threaten to end in a revival of armaments and war, then it must be made powerful enough to coerce the states concerned as they approach the brink of war. But if it has the military strength to interdict armed action by one state on the territory of another, it must, under the view which the Soviet Union has consistently maintained, be subject to veto, and thus be rendered nugatory as an agency of supra-national authority. The whole idea of a supra-national army powerful enough to enforce peace and disarmament seems to the present writer illusory. It must be repeated that peace and disarmament can rest only on a general consensus that war has become an unacceptably dangerous and useless mode in the conduct of international relations, and that adequate alternative modes exist or can be constructed. A consensus cannot be enforced. But the institutions to which it gives rise can be policed.

The true functions of a supra-national police force are those of policemen. And if it is to police a demilitarized world it will have to have certain limited and specified powers of intervention in the domestic affairs of nation states. It will probably have to have limited powers over individual citizens of such states, comparable to (though of course far less extensive than) those which the American Federal government exercises under Federal law over the individual citizens of the American states. It will have to operate in the framework of a consensus which regards warmongering or inciting preparations for war as a crime, and a crime not only against a vague international community, but against the national community of the country where it occurs. To police a demilitarized world the supra-national authority would have to have a certain amount of armed strength and defined powers--really comparable, as armies today are not, to the weapons and empowerment which are given to the police in civil life--but an attempt to provide it with a super-army would be self-defeating.

Lewis C. Bohn has advanced some interesting speculations on what he describes as a "non-physical inspection method for arms control." He argues that what is important is the detection, not of physical violations of arms control agreements, but the guilty knowledge of such violations which must, if the violations are to be of any practical significance, reside somewhere in the minds of comparatively few top leaders of the nation. One of his suggestions for discovering such guilty knowledge is to offer rewards, honors and protections to informers within the country; in other words, turning its general public into an anti-war espionage system. His ideas seem quite fantastic in the present contexts, but they do indicate how a demilitarized world could be policed if clandestine preparations for war became as generally recognized as a crime as, for example, is the trade in narcotics or slaves today. And Bohn's speculations are in themselves one indication that an evolution toward such a situation is going forward.

5. Conclusion

"We are," Kenneth Boulding writes, "totally unprepared for Peace"--"that drab girl with the olive-branch corsage whom no red-blooded American (or Russian) could conceivably warm up to." "We have never had peace, and it may be forced upon us before we really want it We have dreamed of Utopia, and secretly been thankful that it is only a dream. Now we are going to be compelled to think about it, and think hard and long, for we may be forced into it by the absence of any alternative but doomsday."

It is only as that kind of thinking gradually proceeds and a new general consensus develops from it, that the international system can approach the goals of pacification and demilitarization. Sudden, sweeping plans--whether the Soviet plan for total disarmament within four years or the Clark and Sohn plan for establishing world law and disarmament within ten--cannot succeed. It is impossible to encourage a growth by periodically tearing up the plant to examine the roots. Every disarmament conference ever held has probably done more to prevent than to promote disarmament, because it has focussed an exaggerated attention upon factors which are really irrelevant--upon myths of military power and defensive might which do not correspond with realities, upon hopes for military dominance or fears of military defeat which are alike largely illusory. Conferences could be held today looking seriously toward the demilitarization of the world. But they would not record the kind of statements and speeches which both Soviet and Western statesmen now submit to disarmament conferences.

To say that demilitarization and pacification must be gradual is in no sense to support the present Western position, calling for graduated disarmament by rigidly inspected stages. If it were called today, the imagined serious disarmament conference would waste no time on precise periods between the stopping of bomb manufacture and the destruction of bombs, or on technical details of absolutely perfect inspection systems. It would concentrate upon developing the basic governmental attitudes and policies which would encourage the growth of that measure of general consensus necessary if peace is to become possible. The conference would not in the first instance discuss the control of armaments; it would discuss the political and psychological requirements for the total abolition of war. Once these have been defined with some clarity, the useless armies and weapons systems would largely take care of themselves.

To create the general consensus requisite for pacification and disarmament may seem an impossible task, given the nature of men and governments. But actually, a good deal of it already exists and the necessary extensions do not seem beyond the bounds of practical political thought. For progress toward ultimate pacification and

disarmament there must be, it would appear, developing general agreement on these points:

1. That major war has become inacceptably dangerous and destructive; and is practically useless in governing the relations of states. As to the first there is no doubt; we are far along the road to agreement as to the second. The armaments of all great powers have long been maintained for "defensive" reasons only-- "aggressive" war has been considered an international crime for centuries. In the past, the difficulty always was that what one power considered a legitimate "defense" of extra-territorial "vital" interests appeared to the opponent as an illegitimate aggression upon its own vital interests. Since the appearance of the nuclear arsenals this difficulty has to a large extent been removed.

The military policy of the United States (and I think the same is true of the Soviet Union) is today founded, not upon the idea of "winning" even a defensive war, but on the idea of preventing any major war whatever. This is the only rationale of the policy of "deterrence." In the hands of its exponents, deterrence leads to some very gruesome possibilities. But at bottom it is not a system for winning wars but a system for never fighting any wars at all. This is a novel development in military history. The military establishments of the two great military colossi exist, not to fight each other, but to prevent any fighting whatever. Few of the lesser powers have any reason to fight each other, and lack the power to challenge the two colossi. The inutility of war is pretty well exemplified in this situation and should be subject to demonstration to the world at large.

2. That it is better to accept existing territorial borders and political systems than to attempt to change them by organized war. Here again we are close to general agreement. The German, Formosan and perhaps the Israeli-Arabian situation admittedly raise some very dangerous question marks; but what happened after the Napoleonic and the First World Wars has substantially happened in the aftermath of the Second. Each of these conflicts caused great shifts in territorial boundaries and governmental systems. Each witnesses a subsequent period of unsettlement and disturbance, which in each case resolved itself into a fairly workable international structure. The European system after Napoleon lasted substantially for a century. The Versailles system lasted for eighteen years only, but it had been fairly well stabilized, and was finally overthrown less by the evils and errors of the peace than by the rise of new forces which exploited the peace in order to destroy it. Since 1945 the world has again returned to a relative stability, but no destructive force comparable to Hitler's Germany has appeared. Few would regard the present territorial distribution of the world as the acme of justice,

but it does have elements of reason and stability and looks as though it could substantially endure. Great wars are, at any rate, unlikely to improve it, and there seem to be no responsible statesmen in positions of power who think that they would.

3. That adequate means, other than resort to international war or to the threat of it, exist to conduct the power relations of states and of the factions and groups which struggle for power within them. Certainly there is no consensus here, but the international world has in fact been experimenting with such means since 1945. There is a rather striking difference between the period from 1930 onward, in which a series of lesser wars, interventions, military threats and competitive armaments built up to the explosion of 1939, and the period after 1945 in which there has been almost as much war, violence and threat but in which the cumulative, explosive effect has been rather notably absent. The Korean War was perhaps the first consciously limited war in modern history. No one, not even Stalin, was to use the threat of war in the brutal way in which Hitler employed it. To go back to the history of Mussolini's conquest of Ethiopia, Japan's "China Incident," the Spanish Civil War, Hitler's annexation of Austria and crushing of Czechoslovakia, is to go back into what now seems a past and barbaric age. It is true that democratic Czechoslovakia was destroyed a second time, in 1948, by methods not dissimilar from those which Hitler used, but the techniques were different and the threat of a world war was not a part of them. Despite the violence which has accompanied it, the power struggle has already assumed quite different forms from those which were accepted as unavoidable--almost axiomatic--before the Second War and the nuclear arsenals had taught men better. It is reasonable to hope that this educative process will continue.

4. That some measure of veto-free international authority must be accepted generally, simply to police a demilitarized condition. There is little doubt that the peoples of the world (if there were any way in which their combined voices could be heard) would agree to this with alacrity. That the governments and governing elites would do so may be more questionable. Their power, after all, resides in their sovereignty. It is their ability to promise their people protection against foreign military threat as well as domestic economic distress which keeps them in control and in office. To devolve final responsibility for the military security of the state upon a superior international authority would no doubt greatly improve the real security of the state, but in dictatorial countries it could only undermine the security of the governing elite. Fidel Castro, in deliberately converting the United States into a putative military threat to Cuba, did little or nothing for the security of Cuba but the policy was apparently essential to maintain the political security of Castro. In the great, stabilized democracies with their ordered political processes, this factor would hardly

constitute a problem. Whether, considering the small degree of supra-national authority required to maintain security in a demilitarized world, it would be a problem for the military and Communist dictatorships is a question for them to answer.

On this fourth point there is again little or no consensus today; and until a general consensus is obtained on all four there seems small chance of process toward either demilitarization or pacification. At best the consensus will not grow quickly, and there is always the possibility that the world may be overwhelmed by unutterable disaster before the growth becomes sturdy enough to support a more rational international system. But the growing is visible; and there is a great deal that intelligent statesmanship and wise leadership could be doing today to encourage it. Khrushchev, with his plan for total disarmament in four years, accompanied by threats and gestures which make the plan impossible of acceptance, is doing nothing to establish the bases of pacification and demilitarization. But neither is Western statesmanship, with all its protestations of peace plus absolute military security.

Peace cannot be founded on military security, and security of any kind is impossible without peace. But a statesmanship, on either or both sides of the iron curtain, which can genuinely take peace and total disarmament as its goal, which can have the courage to work immediately for a stabilization of the arms race as a prelude to the abolition of the war system itself, and can have the realism to understand that no formulae, no plans or proposals can work until they have been underpinned with the consensus that will sustain them, could be of powerful effect in a world where the rudiments of that consensus are already evident.

INSPECTION FOR DISARMAMENT

Jerome Wiesner

Introduction

There is hardly a subject of which I would profess to have some knowledge that I would approach with more trepidation. I am bold enough to write on it only because I remember James Thurber's admonition in the New Yorker, "It is better to ask some of the questions than to know all the answers."

My uncertainty relates equally to the technical details and capabilities of inspection systems; to the extent of the need for them; and to the likelihood that adequate inspection systems can be made to be generally acceptable.

To begin with, the technical aspects of inspection systems are poorly understood and for good reason: Until recently there have been no substantial scientific investigations of inspection problems, and little effort has been spent on the development of needed detection and information-processing devices. Though research and development work has now been started in some important technical fields related to inspection problems, the effort is still far too small. The development of elaborate technical systems is very costly. When one considers the magnitude of the magnitude of the scientific and technical effort required to begin to understand a relatively simple technical problem like that of detecting submarines, on which the United States has spent hundreds of millions of dollars, one can only imagine what would be required to develop the complex technical systems capable of providing certain detection of the smallest infraction of a disarmament agreement. Fortunately it is easy to show that "certain detection" is not necessary. Something less than certainty is wholly adequate. There is urgent need for sufficient understanding of the possible inspection techniques and systems--to permit an evaluation of their capabilities, to assure that they add up to adequate inspection with minimum intrusion at lowest cost.

In planning a disarmament control system it is important to have an inspection pattern capable of detecting unlawful weapons caches, weapons production, and the movement of forces capable of upsetting the stability of the system. It is generally conceded to be impossible to build a perfect inspection system for controlling the significant weapons, i.e., nuclear bombs, ballistic missiles, aircraft. The problem is to provide a system with adequate likelihood of detecting serious violation. In most situations involving

search and physical inspection, effectiveness of a given system is more or less proportional to its size and cost.

The level or intensity of inspection required to monitor a disarmament agreement is in some way proportional to the degree of disarmament. In other words, the more completely weapons of all kinds are eliminated, the greater will be the necessity for an inspection system sufficiently sensitive to discover small discrepancies in the size of remaining forces. It is also clear that little inspection is required to monitor adequately minor changes in military posture. There is general agreement also on the desirability of limiting inspection and observation systems to those of a strategic nature--that is, those which monitor only such factors as location, numbers and quality of forces and weapons--and to avoid a system which depends upon tactical information requiring rapid transmission and quick reaction. In addition to the obvious difficulty of handling it rapidly enough, proposed monitoring systems based on tactical information often jeopardize the security of the forces they inspect.

While not difficult to get agreement on generalizations such as these, it is extremely difficult to get agreement on a specific inspection system designed to monitor a specific reduction in the level of a specific force or weapon. This situation will persist until there is adequate understanding of the capability of the various systems and until there have been enough weapon-system studies to establish limits on the uncertainty tolerable in inspection system performance. Only with this understanding can we resolve the conflict between United States fear of providing inadequate detection and Soviet reluctance to accept large, costly, and intrusive inspection systems.

In the past, neither Soviet bloc nor Western representatives have demonstrated an adequate understanding of this problem. The disparate fears of the two groups made agreement impossible. Western concern stems largely from (a) the apparent unwillingness of the Soviet Union to agree upon an adequate inspection and enforcement system (although recent statements by Soviet leaders indicate either a change in attitudes or, at least, a more comprehensible manner of expressing their views), and from (b) the belief that it would be impossible to adequately monitor a nuclear weapons ban. The Russians and their allies have been unwilling to accept the level of inspection insisted upon by the Western nations, at least prior to the achievement of substantial reductions in forces and weapon stocks, because of their concern for the military consequences of inspection. Sufficient understanding of inspection system capabilities on both sides may make it easier to remove such blocks to agreement.

In these pages I will examine possible inspection systems for controlling armaments. The term "inspection system" usually implies a physical system including measuring equipment, inspectors, communication systems, etc., like the nuclear test-ban monitoring system, or an aerial reconnaissance system for locating airfields, production facilities, missile bases. Recently, however, considerable attention has been given to a different method in inspection, called "psychological inspection," which seems to offer promise for supplementing physical systems and possibly even for replacing them. Psychological inspection depends upon the "inspection" of people to verify compliance with agreements.

I will consider first the effectiveness of various inspection techniques, then the special problems raised by the principal objects of inspection in the armaments systems of today. Finally, I will deal with the need to phase the implementation of controls and inspection so that there will be no jeopardy to the security of any nation.

Inspection Techniques

In considering the performance of various inspection techniques in a system, the environment in which it must operate is of primary importance. For instance, the requirements for an inspection system designed to monitor only a single specific arms limitation agreement will undoubtedly be different from those of a more complete disarmament system. An example is the inspection system for a nuclear test ban. To function satisfactorily in a world which permits a continuing arms race, it must be fairly complex and complete. On the other hand, such a system might be unnecessary in a world in which nuclear materials production and stockpiles were restricted. Similarly, the amount of inspection required to discourage clandestine production of nuclear material would be greatly affected by limitations on weapons delivery systems such as missiles and aircraft.

This seems to imply that in a comprehensive disarmament system which restricted all types of weapons, control of a single component could be relaxed; the interaction of the various inspection systems would make up for the uncertainty permitted by any one. The value of these interactions has not been enough examined, and their complexity makes understanding of a comprehensive arms-limitation system difficult. If one ignores the interaction effects and plans adequate inspection systems for each of the components under control, the resulting inspection scheme is more tractable and easier to understand, but it will be much too costly and difficult to implement. And, it is obvious, the more complicated and expensive an inspection system, the more reluctant will all participants be to

permit its installation. Furthermore, a sophisticated and highly technical system requiring specialized new equipment (such as better seismometers for detecting underground explosions or special large radars for detecting missile firings, or more expensive data processing systems) will take longer to develop and install than one that depends primarily upon the efforts of people or on available devices such as existing photo-reconnaissance equipment or air defense radars. There appear to be many ways to design a satisfactory observation system for monitoring disarmament agreements. It behooves the designer to select the one which results in the least disturbance to the host countries, entails the least cost, and is the most easily achieved.

Techniques of inspection will vary of course with what one is inspecting for. Among the key objects of inspection are:

(1) Production facilities for:

- (a) nuclear materials,
- (b) missiles and aircraft,
- (c) ships and submarines,
- (d) missile defense systems,
- (e) ground force material, and
- (f) biological and chemical warfare agents.

(2) Numbers of:

- (a) ground forces and equipment,
- (b) missiles,
- (c) aircraft,
- (d) ships and submarines
- (e) nuclear weapons.

(3) Military research, development and testing activities.

Techniques available for physical inspection fall into two basic categories: ground inspection employing resident and mobile inspectors with appropriate technical aids, and aerial (satellite) inspection and observation. It is probable that the same aerial search and inspection techniques can be used for detecting or observing very different objects of inspection.

Aerial reconnaissance for search and verification--The high effectiveness and relatively low cost of photographic aerial reconnaissance suggest it as a basic tool in any comprehensive arms control system. If the parties have agreed to eliminate or to disclose military installations or facilities for producing weapons, photographic reconnaissance, even from high altitudes, can adequately

check on the accuracy of the disclosures and can uncover unlawful hidden installations.

General coverage by high-altitude aerial photography can, of course, be supplemented by ground inspection where the photograph raises some suspicions. In fact, high-altitude photography could be supplemented by some "very-high-resolution," low altitude reconnaissance, that is, photography giving sufficient detail to permit examination with high confidence of any suspicious area uncovered in the courser high-altitude photography. Such high-resolution photography would, of course, reduce correspondingly the need for ground inspection to check suspicious areas.

The Soviet Union and satellite nations comprise a land area of approximately fourteen million square miles. The Western bloc is roughly the same size. Complete high-altitude coverage of this area could be obtained by flying about 1,500,000 linear miles; to do this would require about 500 successful flights. Experts estimate that when effects of weather, season, aborts and processing loss are taken into account, approximately 7,000 sorties are required. (This number is probably high.) One hundred and eighty aircraft would be required to complete this task in one year. If a time-phased program (to be discussed later) permitted only 20 per cent of a country to be examined during the first year, only a fraction of the aircraft would be needed during that period. The same force would be adequate for inspecting each new area as it opened up, but some augmentation might be desirable for re-examining previously photographed territory. A force approximately 10 per cent the size of the high-altitude force will provide adequate low-altitude capability.

Approximately 1,500 photo-interpreters would be needed to handle the output of the aerial reconnaissance system if it were fully implemented. During the first year of operation of a phased program, the number of reconnaissance aircraft would probably not exceed 40, and so only about three hundred photo-interpreters would be required for examining the film.

The degree of coverage proposed here is more than enough, for the immediate future, for verifying or repudiating the good faith of the participating nations with regard to emplaced missiles in launch sites, without the use of any other information. When aerial reconnaissance is used in conjunction with other techniques for verifying disclosures, it will undoubtedly be possible and desirable to reduce the flying effort.

Ground Inspection--A variety of techniques will probably have to be employed to monitor the production and deployment of the many weapons and military forces it will be desirable to control. In addition to the specialized inspection systems which may be created for specific purposes, it will probably be necessary to have a ground system to augment the aerial search capability.

Inspection by personnel, with or without equipment of different kinds, is, of course, what is normally contemplated when people speak of "inspection." To some it may seem the only reliable form of inspection. It would, however, be expensive, frequently prohibitive, if all inspection for various aspects of comprehensive arms control had to be done on the spot by inspecting personnel. Ground inspection is also, usually, the most intrusive, the kind which closed societies would be most reluctant to accept.

Fortunately, it is possible to combine different kinds of inspection, so that for many purposes ground inspection is not necessary except to supplement and to check on mechanical inspections when the machine gives some basis for suspicion. Fortunately, too, a comprehensive control system would have comprehensive inspection systems so that information gained in inspecting one operation is available to help check on related operations to give a reliable picture of the whole military situation.

Far more effort is needed to develop additional means of detection, although no matter how much progress is made there will always be need for ground inspection. With the methods of detection we have today, and space techniques in checking on military and industrial installations, facilities and activities; to inspect operations, examine records, and scrutinize personnel, in connection with any facilities subject to limitation or control; to carry out interrogations of personnel in such facilities, or of persons in authority under possible plan for psychological inspection discussed below; to operate the machines, e.g., radar or seismic systems--and to process the data.

Industrial Production Inspection: * Any comprehensive arms control program would involve constraints of some form on new production of ballistic missiles, long-range bombers and cruise missiles, and many other weapons (such as tanks) as well. Such controls of production can be monitored, and I offer here an example of an industrial production inspection system that could be used to monitor such constraints. This example does not explicitly consider nuclear

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Prepared with the assistance of Dr. D. G. Brennan.

production and leaves aside the question of whether nuclear production inspection should be integrated with general industrial production inspection. It must be emphasized that the illustrated system is highly tentative.

The inspection function contemplated is a data-gathering and data-processing function. In order to achieve a very high degree of confidence that no clandestine weapons were being produced, the system would have to process a very large amount of information.¹

It is probable that the inspection system sketched below would provide more information than necessary to establish sufficient confidence in view of other inspection and control functions which might also be performed. In that case, the inspectorate would either be reduced or maintained (with some possible reduction in field staff) for an industrial census function.

The setting of the system would be as follows. Some production of rocket vehicles (for outer space exploration, replacements for permitted ICBM's, etc.) and long-range aircraft would presumably be permitted. Components of military weapons that are either difficult to manufacture or easy to identify, or both, will be regarded as "critical." Then all plants authorized to produce critical tools, components or assemblies (including final assemblies) will be classified Type I plants, and will have resident inspectors. The major Type I components and tools would include the following:

- (a) high-precision gyros and inertial guidance systems,
- (b) gas turbines of various sizes (jet engines, auxiliary power units for rockets),
- (c) LPR (liquid-propellant rocket) rocket engines,
- (d) aircraft and rocket airframes,
- (e) SPR engines and solid propellants,
- (f) re-entrant assemblies,
- (g) high-precision machine tools for gyros, etc.

Type I plants in the United States would probably not exceed 200; in the Soviet Union there would be fewer. Control of additional weapons, such as tanks, would enlarge the list, but only moderately.

¹ Much of this information would also be of great constructive utility to economists, industrialists, government production officials, and others. A relatively small increment in the staff and equipment of the inspectorate would enable it to provide essentially all such information that might be desired. Constructive functions of this type would contribute to the long-term goal of an improved political climate. Of course, the additional information also contributes additional assurance that the agreed production constraints are being observed. It should be of especially great use to countries with a planned economy.

A great many plants would have machine tools or other production facilities suitable for producing one or more components of aircraft or missiles. In the United States, as of 1947, there were about 70,000 such plants, employing about 5 million production workers, for an average of about 70 workers per plant. All such plants that would not be Type I we call Type II plants. These would be subject to semi-random sampled inspection with a mean recurrence time of six months. Using the United States figures just quoted and assuming that a two-man Type II inspection team could cover about 200 production workers per team-day, including travel time, complete coverage of the 70,000 Type II plants every six months would require a force of about 500 inspectors (250 teams). These inspectors would primarily seek to detect any Type I tools and components, but would also check production records (at least cursorily) against the visible plant facilities. Plants whose facilities were immediately suitable for production of critical components would be more closely (and perhaps more often) checked than others.

Remaining manufacturing facilities (to be denoted Type III) would consist of food-processing plants, textile mills, garment factories, lumber products, and other industries not requiring Type II facilities. In the United States, in 1947, there were about 170,000 Type III plants, employing about 7 million production workers, for an average of about 41 workers per plant.² These would be checked simply to assure that there are no Type II facilities, using semi-random sampled inspection with a mean recurrence time of a year. In this case, the inspection rate is probably determined primarily by the number of plants and the travel time between them, the amount of time required to scan the average small Type III shop for such things as, say, boring mills, which are quite small. Using the United States figures above and allowing something over two hours per plant, including travel, a force of 250 two-man teams could cover all 170,000 plants in a year.

The inspection teams would probably operate out of field offices. Perhaps 100 field offices would be required, with one supervisor and two clerical-secretarial types per field office.

The heart of the system would be a records control center, equipped with much data-processing equipment. The staff envisaged for this would be about 1,000-1,200, including industrial production analysts, economists, data-processing experts, psychologists, programmers, machine operators, special field investigators (200-300), etc. The total force required would then be:

² Encyclopaedia Britannica, Vol.22, p.750 c(1953 edition).

Type I	(resident) inspectors	200
Type II	inspectors	500
Type III	inspectors	500
Field office personnel (other than above)		300
Records control center		<u>1,200</u>
	Total	<u>2,700</u>

Of this total, perhaps 1,000 might be required at the start, when phased inspection began. The balance would be built up at 20 per cent to 30 per cent a year.

The initial design of the system would probably include the establishment of plant classification criteria, product classification and assignment of product code numbers, character of output information required, required degree of programming flexibility and amount of information storage of various types, design of records-reporting forms and associated equipment for automatic read-out of data, and over-all design of the data-processing system.

Initial operation of the system would include identification of all declared Type I plants, by methods discussed below under Inspection and Control of Ballistic Missiles, and establishment of resident inspectors therein. Inspection of Type II and Type III plants would commence in areas opened for general inspection in accordance with the time phasing provisions of the agreement. All plants would forward complete production, shipping and receiving records to the records control center as specified intervals, retaining duplicate copies of such records to be picked up and checked against plant facilities (generally in a cursory way) by the field inspectors when they arrive. The field inspectors would then periodically forward such duplicate records to the control center by couriers for checking the mailed reports.

Virtually no data upon experience exists for establishing the validity of the system proposed here. There is probably no way of doing so that does not involve rather large-scale experimentation in actual industry with search teams attempting to find clandestine production buried within the legitimate activities of a large industry. While such detailed search techniques are probably unnecessary for monitoring disarmament systems other than those that approximate total disarmament, it would nonetheless be worthwhile to carry out sufficient experimentation to create the capability to do production inspection with confidence if it should be needed.

Random Sampling Techniques: At many stages in the implementation of arms limitation agreements it will be necessary to ascertain that the participating nations have actually reduced the size of forces and weapon inventories to the agreed-upon levels, and

to establish with a high degree of confidence that no substantial stockpiles of dangerous weapons have escaped detection. Obviously this can be done in theory by making a minute and thorough search of an entire country, but such an effort would be costly and lengthy. The purpose of this section is to demonstrate that a high degree of confidence can be established, even if only a fraction of the total area is searched thoroughly.

An arms control system would begin with a complete disclosure of all military weapons and forces. (Only partial disclosure may be required, at any one time, of the location of critical weapons.) The initial task for the inspection authority then becomes verification of the authenticity of the data provided. The proof need not be absolute; it must be adequate.

For example, an 80 per cent chance of detecting a violation may not seem adequate. In such a case, however, a potential violator would have only a 20 per cent chance of avoiding detection, and if the system were designed so that possible violations could not result in a major advantage to the violator, it is doubtful that any country would take such a chance. To determine the nature and "size" of the risks, and whether confidence in the inspection system is warranted, requires detailed analysis of the controls desired and of the inspections available--the relative importance of each category of weapons, the significance of changes in the size or location of various components of each system, and the threats posed by various combinations of residual weapons.

There are many ways to use sampling techniques to reduce the inspection effort without introducing undue risk. To illustrate the technique, a simple situation will be examined. The reader can understand the principle if he will not let himself be frightened by a few mathematical symbols.

Assume that all missile locations within a given country must be made known to the inspection authority, and that for safety it is necessary to establish, with some degree of assurance, that the actual number of missiles does not exceed the disclosed number by a given factor, say 50 per cent. Further, assume for simplicity that the legal and illegal missiles are distributed uniformly throughout the country. For inspection purposes the country will be divided into n separate zones of inspection. If N is the total number of missiles in the country, there will be $\frac{N}{n}$ declared missiles and $0.5 \frac{N}{n}$ undeclared missiles in the zone. Further, assume that the authority has the capability to inspect some fraction, k , of the zones at a given time. The zones to be examined will be selected at random by the inspection authority so that no opportunity will exist to shift weapons from one zone to another to avoid detection.

In a zone to be searched, the inspectors will first check the declared sites and then, using aerial reconnaissance techniques and ground inspectors, look for undeclared sites. If the zones are small enough to permit a thorough search, the examination of a small number of them will establish a high degree of confidence in the veracity of the disclosure--if no violations are found.

If p represents the probability of detecting a violation in a single zone, the assurance provided by multiple sampling of the zones is easily calculated. The probability of a violation escaping detection if kN zones are inspected is $(1 - p)^{kN}$. The statistical confidence, A , that the system would provide can be found from $(1 - A) = (1 - p)^{kN} =$ probability of not finding a violation.

To illustrate the effectiveness of the method, a hypothetical case will be examined. Assume that the country is divided into 200 zones and that 20 of them are inspected in a given period. Further, assume that p , the probability of detecting a violation in any one zone, is 0.8. Then

$$(1 - A) = (1 - 0.8)^{20}$$

or $A \approx 0.999$ = probability of finding at least one violation.

If $p = 0.3$ and 10 zones are inspected,

$$(1 - A) = (1 - 0.3)^{10}$$

$$A \approx 0.97$$

If $p = 0.3$ and 5 zones are inspected,

$$(1 - A) = (1 - 0.3)^5$$

$$A \approx 0.825$$

In the last case the probability of finding a single violation was small (only 0.5) and only 5 out of 200 zones were subjected to inspection, yet the probability of finding at least one violation is very high. If the inspection was indeed so sparse, it would be a very poor strategy for the violator to distribute his violations uniformly over his country. If he placed them all in one zone, the probability of detection would only be $5/200 = 0.025$, but if they concentrated them in this way, this would establish such a large effort in one spot that it would be much harder to hide the whole effort. Continued inspection would find such a violation. A reasonable inspection procedure would be to examine 5 to 10 per cent of the total area at any one time, and to have several cycles of inspection per year so that 30 to 50 per cent of a country would be covered in that period.

It should be noted that the individual zones can be further subdivided and some of the subdivisions--selected at random--exposed to very intense inspection to reduce the probability that

violations within a zone could go undiscovered.

While these examples are idealized, they do serve to demonstrate that adequate safety can be achieved without complete inspection.

It is essential to the foregoing argument that the separate inspection zones be selected in such a way that they are operationally equivalent. This means that factors such as the number of declared missiles, ease of deploying missiles, terrain and climate impediments to missile installation or inspection, and special problems concerned with zones at national boundaries (land or sea), as well as the size of the respective land areas, must be considered collectively in dividing a country into inspection zones. For example, if in two equal land areas the other factors listed are considerably different, the time for inspection by a given team may differ by one or two orders of magnitude. Thus, much of the confidence in random sampling techniques will depend on the ability to define and reach agreement on equivalent zones.

Non-physical Inspection--Many writers have suggested that there would be merit in employing non-physical inspection to monitor compliance with disarmament agreements. In this category are included interrogation of key personnel, as for example military and civilian leaders, scientists, engineers, production workers in key industries, with or without the use of lie detectors; public relations campaigns to convince individuals that clandestine activities are a violation of sacred world agreements; offers of large rewards for disclosure of violations of agreements. A specific proposal for using non-physical techniques in monitoring arms agreements has been made by Professor J. Orear of Cornell University.³ To illustrate how such techniques might be employed, Orear has suggested possible provisions in an arms control treaty. For example:

1. The treaty could give the international inspectorate the right to ask any citizen questions concerning possible treaty violations. If desired, heads of state could be excluded without much loss of effectiveness.

³ Orear, "Non-physical Inspection Techniques," paper delivered at the Sixth Pugwash Conference, December 1960, Moscow; "New Approaches to Inspection," Bulletin of Atomic Scientists, March, 1961.

2. The treaty could legally require all citizens (except possibly heads of state) to answer all relevant questions when interviewed by the inspectorate. It could provide for punishment of citizens who refuse to answer relevant questions or who are found guilty of lying to the international inspectorate.

3. Substantial rewards (e.g., \$100,000 or more, non-taxable) could be provided for citizens who report verifiable violations to the inspectorate.

4. Assuming a reliable lie detector could be developed and proved, the treaty could give the inspectorate the right to use such an instrument in their interviews.⁴

5. The treaty could make it the duty of each citizen with knowledge of any treaty violation to report it to the international inspectorate. Failure to report could be made punishable.⁵

6. The treaty could guarantee to a person reporting a violation that he and his family can obtain sanctuary abroad whenever they so desire.

7. There could be an agreement that the leaders of both sides must give such provisions their enthusiastic support on a regular basis through the mass media.

The possibility of using such methods is intriguing, but meets with widespread skepticism as to their acceptability, feasibility, and effectiveness. Moreover, there may be strong distaste for a system based on "informants"; there is also widespread abhorrence for the use of devices like the lie detector. The latter reaction is based partially on a normal revulsion against the violation of human privacy, and in part upon the fact that such instruments have often been misused by incompetent or not entirely reputable operators.

⁴ This technique is discussed in a later section of this chapter. At present it would not be acceptable to most people, and in my opinion there should be further study before it is considered seriously.

⁵ The treaty could also establish easy channels of communication between citizens and the inspectorate. For example, Professor Melman has suggested that the existing postal systems could be used to provide tamper-proof communication. Melman, "Inspection for Disarmament," Columbia University Press, 1958, p.41.

In fact, a careful investigation made during the course of a recent American Academy summer study has led to the conclusion that lie detecting techniques are not entirely understood and that considerable research is required to establish their range of usefulness and reliability.⁶

The usual initial reaction of individuals is to oppose the use of non-physical inspection techniques. But it is clear that if high confidence could be placed in a combination of such techniques, including the use of lie detectors, then the inspection of disarmament agreements would be made much simpler. It might even be possible to dispense with most of the elaborate physical inspection system otherwise needed. Confronted with a choice between the judicious use of these techniques and the continuation of a violent arms race, most of the citizens of the world would probably accept the former. In any event, the less extreme forms of psychological inspection, such as questioning in the absence of lie detectors, public information programs, etc., would be an important adjunct to any physical inspection system.

⁶ See Milburn, Kubis, Salpeter, Orear, "Non-physical Inspection Techniques," and the seminar on "The Role of Psychological and Personnel Inspection"--Summer Study on Arms Control 1960, American Academy of Arts and Sciences.

The Objects of Inspection

The objects of an inspection system are to deter a would-be violator of the control agreement by making it highly probable that his violation would be detected, and to detect any violations which in fact occur. Obviously, the efforts to detect will be related to the likelihood of a violation, to the advantages which a violation would give to the violator, to the dangers which it would create for the other parties if undetected. If the dangers due to a particular violation are great, the need for detection and the efforts to detect will be intense. If relatively little advantage would accrue to the violator from a particular violation, it is less likely that he would violate and there is less urgency for detection.

A comprehensive control agreement would have a number of objects of inspection; these differ in the likelihood of violation, the dangers which violation would bring, as well as in the effectiveness of available methods for detection, singly or in combination. In all respects the most serious problems are posed by controls on nuclear weapons and ballistic missiles and on future research and development. Because the control of ballistic missiles is critical, I will deal in detail with a possible ballistic control system. In addition, some monitoring of conventional aircraft, land forces and naval forces cannot be neglected.

Nuclear Stockpile Control--In today's military strategy and weapons technology, weapons and the methods of delivering them to their target are both essential to a nation's armed power. Any effective limitations or controls on one of them will in effect limit or control the other, and the total military force. Inadequacies in the control of weapons of inspection and control in each area occur, but assurance is afforded by supplementing and overlapping controls.

The principal obstacle to planning safe nuclear disarmament today is the lack of any means for detecting hidden stockpiles of weapons. Any agreement to destroy or limit or disclose the whereabouts of nuclear weapons would be subject to the danger that one party is hiding some weapons, there is not at present any mechanical means for detecting clandestine stockpiles, and ground search without special equipment is not a practical possibility.

The problems would be largely eliminated of course if one knew with substantial accuracy the size of a nation's stockpile; then failure to deliver up or to disclose some weapons would be readily known. One can determine the approximate size of a nation's stockpile by inspecting means of producing these weapons in the past. It is estimated, however, that at present there is uncertainty, or "noise"

in such measurements falling in the range of 50 to 500, that is, one might guess wrong by between 50 and 500 large nuclear weapons if past production of such weapons were estimated by known methods of physical inspection.

This suggests the need for developing additional methods of detection. If methods for detecting stockpiles do not appear a promising undertaking, much might be done to improve methods for determining past production so as to make it possible to estimate the existing stockpiles with adequate accuracy. The development of methods of psychological inspection would also contribute to a solution of this problem.

Until this problem is solved, it is possible for some clandestine stockpiles to exist undetected. Many believe therefore that while agreements to reduce the stockpiles are possible, the United States should insist on retaining a small nuclear deterrent until an adequate inspection system for stockpile control is developed.

Controls on production of new nuclear materials present a different and easier problem. Many of the techniques in the system suggested above for detecting production of missiles and other weapons would be available for controlling production of nuclear materials. While small amounts of material, enough to make a few bombs a year, might be diverted from peaceful uses for a short time, this would not be a serious danger and need pose no insuperable problems.

Inspection and Control of Manned Bombers--Manned bombers are today the principal weapon of surprise attack or immediate retaliation, and though they may ultimately be superseded by ballistic missiles, any practical arms limitation plan must provide controls for them. Short-range and medium-range aircraft capable of carrying nuclear weapons must be included in the control system as well as the long-range aircraft of the strategic air force.

If aircraft are allowed to remain in the hands of national forces during any phase of the evolution of an arms control system, they must be considered part of the total permissible deterrent force. Some military aircraft having nuclear "payload" capability might be excluded from this category if their radius of action were so limited that they obviously could not be converted into a threat against other legal deterrent forces.

Because of the vulnerability of bomber bases to missile attack and because air defense systems make the effectiveness of manned bombers somewhat uncertain, they may not be an attractive component of a stable deterrent system. It is hard to visualize

building a bomber force as secure from attack as missile forces can become (unless it is kept in the air). Consequently little dependence will be placed upon bombers in the long run, though if a diversified deterrent force is desired, they will continue to exist. And as long as they exist, they must be regarded as a serious threat to stationary elements of a missile deterrent system, for they can deliver the "large yield" weapons. In any event, so long as bombers exist in large numbers, they must be taken into account in planning a stable system.

If the number of a nation's manned bombers is limited by agreement, the inspection system will have to verify compliance with the agreed limits. To do this it will be necessary to ascertain the location, type, number and condition of all military aircraft and the manpower associated with them.

Initial disclosures of retained legal aircraft can be verified by inspection of airfields. If it is mandatory to disclose the location of all airfields and aircraft thereon, random search, aided by aerial photography, can quickly determine the accuracy of such a disclosure. The veracity of inventory disclosures probably can also be checked properly with intelligence information. This independent check, plus the initial inspection effort, will determine the intensity of the search for possible evasions in disclosure. The size of the bomber forces can be determined to almost any accuracy desired.

Monitoring at aircraft factories would ascertain that production restrictions were being respected.

Inspection and Control of Ballistic Missiles--The acceptability of almost any comprehensive arms limitation and control system will be determined to a significant degree by the feasibility of dealing successfully with ballistic missile control. Many military specialists believe it possible in principle to create a stable deterrent system using only a relatively small number of ballistic missiles combined with an inspection and control system sufficient to preclude the existence of a clandestine force strong enough to be a serious threat to the legal deterrent forces. We noted above the advantage of limiting the permissible nuclear weapon stockpile as well as the ballistic missile force to place an indirect constraint upon the maximum size of the attack force that could be built up clandestinely. While it might appear that adequate security could be obtained by effective controls on nuclear stockpiles alone, there is advantage, we have seen, in a system in which several different types of controls are imposed upon each of the major weapon systems.

Control of the size of a ballistic missile force, then, may be a crucial problem in implementing a disarmament system, and for this reason the ballistic missile inspection problem will be looked at in detail. This will be done by examining how the various techniques previously discussed could be combined to provide a possible missile inspection system.

1. **Verifying Limitations on Missile Stockpiles:** Suppose that under a control agreement a nation may retain only a given small number of missiles as a deterrent force. The inspection system, then, would have to be able to verify that the reduction to this level took place, and that there are no clandestine increases later.

The control system would require the party to the agreement to inform the inspecting authority how many missiles it had manufactured, how many it was now giving up to reduce to the required levels, where these remaining missiles are located. The control authority would check production facilities and records, interrogate personnel in missile development and production, to check the report on the number of missiles that were produced in the past. It would also check the locations of the declared missiles. By aerial reconnaissance supplemented by ground inspection the entire area would be combed for clandestine missiles. In a phased program (discussed below), the process could be extended piece-meal as further areas are opened to inspection.

It should be stressed that the inspection system need not be able to detect every clandestine missile which may exist. If, by using random sampling techniques, the system affords high confidence that it would detect one clandestine missile if a number of them exist, it would make it highly unlikely that a party would risk secreting a substantial number of missiles.

2. **Disclosure of Data Pertinent to Ballistic Missile Control:** The following information should be provided to the missile control authority:

- (a) The number of ballistic missiles of all types that have been produced and the number still remaining in national inventories.
- (b) The current production rate.
- (c) The location of all missile bases on a time scale and in a manner consistent with the time-phasing and geographic-phasing of the control agreements.

- (d) Location of all technical installations contributing to, or capable of contributing to, the development and production of ballistic missiles:

Laboratories and fabrication shops
 Component suppliers
 Test facilities of all types
 Suppliers of ground support equipment
 Civil engineering groups who have worked
 on base construction.

- (e) The identity of all technical personnel who have worked on missiles or missile components or whose background qualified them to do so, and their current activities.
- (f) The identity of all military or civilian personnel who have been trained to use or service missiles, and their current assignments.
- (g) Complete design, development and production information on all rocket vehicles in current or recent use or under current or recent development. This information should include design and development reports on rocket engines, airframes, guidance system, fuels, and service, support and test equipment; special machine tools and other production tooling requirements; and the design and production tooling requirements for re-entry vehicles; but information on the firing mechanism or other detailed aspects of nuclear devices for warheads would not be provided.
- (h) Military budgets and all research budgets.
- (i) The location of all non-military research and development facilities, and their activities, and the identity of all of their scientific staffs.

3. Prerogatives of the Inspection Authority: To authenticate the information disclosed, by various complementary techniques, the inspection authority must have the following prerogatives:

- (a) The right to examine all records of organizations which might be involved in missile production.
- (b) The right to interrogate any personnel believed to be involved. These persons should be subject to agreed upon punishments for failure to cooperate with the control authority or for making false statements.

- (c) The right to station permanent inspectors at any of the declared facilities (with the possible exception of operational launching sites in the case of legal deterrent vehicles) if it is deemed desirable by the control authority.
- (d) The right to examine transportation records and government fiscal records.
- (e) The right to conduct aerial reconnaissance and physical search for undeclared facilities in accordance with the time-phasing and area search agreements discussed below.
- (f) The right to conduct the industrial production inspection previously discussed.

4. Procedures for Verifying the Disclosed Missile Information: In this section it is assumed that at some time prior to the beginning of the implementation period, agreement will have been reached on the techniques to be used for verification and search, and that there will have been enough time to plan the details of the inspection and control system, to design and procure equipment, and to train key personnel. If there is not enough time to do these things, the implementation period might have to be lengthened somewhat to permit a slower start-up.

After each participating nation has given to the control authority the information regarding stockpiles, facilities and personnel, the verification techniques described could be used to check the veracity of the disclosures. While no basis exists for judging the performance of the industrial inspection system or of the interrogation techniques one might employ, it is probable that either method would permit the discovery of any significant discrepancy in the disclosed information. Continued application of these inspection methods will provide assurance of an up-to-date picture of the actual status of the missile stockpiles, as well as increasing confidence in the veracity of the original information. The information gained in these activities may be useful in guiding the physical search effort.

Aerial photographic techniques would be a direct means of searching for undisclosed missile bases and for undisclosed missile production facilities (obviously the same photography can be used to search for other clandestine facilities).

It is satisfactory to commence aerial search in a gradual manner, allowing the portion of a country open to aerial search to increase as progress is made in the reduction of arms. Each participating country might be required to divide its territory into a

number of inspection areas having more or less equal military significance, as proposed by Professor Sohn,⁷ and to specify the areas at the beginning of the implementation period. During the first period of operation the authority could select a fraction of the areas for detailed inspection by aerial reconnaissance and other means. The host nation will be required to supply detailed information regarding all pertinent installation in the area. This will be checked by the search. One would have a high degree of confidence in the accuracy of the disclosed information if high resolution search of the opened area did not reveal any significant discrepancies.

If the implementation were carried out in ten six-month intervals, during the first period it would be necessary to search ten per cent of a country. For the areas discussed in the phasing proposals below this would mean searching 2.8 million square miles of territory. Allowing for bad weather, mechanical difficulties, etc., this could be done completely in six months with fewer than twenty aircraft. If only ten per cent coverage were required, two aircraft--plus spares--would suffice.

As time passed it would be necessary to recheck the open areas to keep up-to-date.

Within areas opened to inspection according to the time phasing of the agreement, mobile inspection teams in trucks, automobiles, helicopters, and boats could supplement airborne search for clandestine sites and facilities. Such teams may use devices such as mine locators, or acoustic depth indicators for underwater search, and may physically inspect any building or other structure large enough to hide a missile site, or which appears to house undeclared production facilities. Though these techniques appear unnecessary, it is desirable to have the right to use them if the control authority deems it necessary.

I believe that it is possible to design highly effective inspection systems using combinations of the techniques described to assure that missile limitation agreement is being observed. The choice of the techniques and the intensity with which they will be employed will depend upon the character of the limitations imposed upon missile forces and the preferences of the participating countries.

Missile Test Detection--The objects of control I have considered--nuclear stockpiles, manned bombers, ballistic missiles--are key elements in contemporary weapons systems, and therefore

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See below.

key objects of concern for possible comprehensive arms control agreements. In this section and those which follow I consider other possible objects of inspection, as part of a comprehensive system or for more limited control agreements.

One limited disarmament measure often proposed is to restrict the development of improved ballistic missiles. The primary purpose would be to prevent missile improvements which would make future disarmament agreements more difficult, since the development of very small ICBM's and very accurate guidance systems would make stable missile limitations much harder to enforce.

One means of controlling further rocket system development would be through the prohibition of testing activities. This could be monitored by means of several possible surveillance systems. Since missile tests can be mounted with relative ease almost anywhere (e.g., from the deck of a ship), the surveillance system would probably have to allow for world-wide coverage, except for areas that could be monitored by means of aerial inspection. Possible surveillance or detection techniques that might be used singly or in combination include:

- (1) Ground-based conventional radar
- (2) Ground-based high frequency radar
- (3) Airborne infra-red detection
- (4) Acoustic detection
- (5) Detection of fuel products
- (6) Radio beacons or transponders on authorized vehicles
- (7) Satellite-based infra-red detection

Some of these techniques, notably (2), (4), and (5), are improperly understood at present. Partly in consequence of this fact, detailed designs of suitable surveillance systems are not to be had at present. However, some tentative preliminary studies clearly indicate that reliable detection is feasible. The system cost might be between 100 million dollars and perhaps 5 billion dollars, depending on the techniques and the detailed character of the information the system is required to supply. It may be desirable to have the system perform constructive functions beyond mere missile-test detection, such as satellite bookkeeping or air traffic control. Such functions could have considerable effect on the character of the system.

It may be noted that a reliable missile-test detection network could also help monitor agreements on outer space control, such as a prohibition of outer-space testing of nuclear weapons, or a prohibition of launching of any kind of weapons into orbit.

Inspection and Control of Naval Forces--A modern naval force is capable of fulfilling three more-or-less distinct roles. First, it retains the traditional role of maintaining, if it can, control of the seas, using surface, subsurface and airpower to do so. Second, it can be an important component of "conventional" military power, providing transportation, airpower from carriers and amphibious forces for land-sea operations. Finally, naval units can make an important contribution to a nation's deterrent force with a nuclear-armed aircraft and missile force.

Unfortunately, there is not a sharp distinction between naval forces needed to support a "conventional" military posture and those capable of use for deterrent or aggressive nuclear purposes. For example, modern naval fighter and attack aircraft can deliver small nuclear weapons and so must be regarded as potential components of a nuclear attack force because of the mobility of the aircraft carrier on which they are based. The desirability of naval aircraft as a component of a limited war force may have to balance against a wish to strictly limit the number of a nation's aircraft with nuclear attacking potential.

Monitoring of Naval Forces Used as Deterrence: Mobility is important to the security of a deterrent force. Providing such mobility by ships or submarines at sea is particularly attractive for several reasons. The vast expanses of ocean make it difficult for an enemy to keep track of ships and virtually impossible to find submarines. Furthermore, they can be stationed far from the homeland and thus escape attack against deterrent forces based there. As a carrier for ballistic missiles the submarine has low vulnerability.

As pointed out, aircraft on ships as well as missiles must be considered when taking inventory of naval weapons capable of nuclear attack, and restrictions may have to be placed upon them. The simplest and most reliable means of controlling the seaborne threat is clearly through restrictions on the vessels themselves, and the easiest to monitor are those limiting either numbers or deployment or both. Limitations on the amount or nature of armaments aboard vessels, or on their state of readiness, are more difficult to monitor.

The best way to control potentially dangerous fleet units, such as aircraft carriers, submarines, missile-carrying destroyers, is to restrict their movements. The easiest restriction to monitor is a limitation on the fraction of the force outside port. Then relatively simple observation will indicate whether agreements are being respected. If only a portion of a total fleet is allowed out of port at any one time, checking will be no great effort assuming, of course, an accurate initial count. Inspection to insure that new vessels are

not being constructed will be easy to perform.⁸

This form of control will be satisfactory for missile-carrying submarines used as part of the secure deterrent force. By agreement, some number of submarines--or possibly some number of missiles--will be permitted out of sight of the surveillance system. Any number in excess of this will be restricted to port. From the stability point of view it would be desirable to limit the number on each side to the level necessary to support the deterrence level. The submarine force levels will have to be established by the arms control agreement.

Control of Other Naval Forces: The size of non-nuclear naval forces will be determined by the conventional force needs, i. e., the limited war requirements, and should be the subject of specific agreements.

If the restrictions on naval forces limit only the type and number of units permitted to exist or to be at sea, the inspection task will be easy. If restrictions are placed on areas of fleet operation, then there will be a more troublesome surveillance task, though manageable.

Some difficulty will result from the fact that certain naval forces desired as components of a conventional weapons force will have potential for surprise attack. The carrier-based aircraft is an example. Several possible solutions to this problem have been suggested. The range of carrier-based aircraft might be limited (by limiting the types of aircraft); nuclear weapons stockpiles could be so restricted that no weapons were available for use with carrier-based aircraft; or carrier-based aircraft could be regarded as nuclear weapon carriers and counted as part of a deterrent force.

Limitation and Control of Ground Forces--The purpose of agreements limiting the size and possibly the character of ground forces is to insure that no party (or combination of parties) possesses such a superiority that it could successfully carry out aggressive actions. Here too, the inspection system has the dual purpose of (1) making sure that limitations are being adhered to, and (2) affording information on general location and state of readiness of the military forces permitted to exist.

This problem is discussed in an annex prepared for the Geneva Surprise Attack Conference. See Technical Discussions on the Problem of Surprise Attack, Geneva, Switzerland, November-December, 1958.

Each of the armies being inspected may have associated with it air arms, also subject to control. Because of the extensiveness-number, size, etc.--of significant land forces and the relatively slow speed with which they can be readied and moved, their control is comparatively simple. The same techniques will apply whether the objective of an agreement is complete abolition of all military units except those permitted for internal security purposes, as might be the case if a satisfactory U.N. force existed, or just a reduction of national forces to less dangerous levels. (A complete ban might require more intensive inspection initially, the level of inspection required being determined by the size of the international security force.)

It is assumed that any agreement on limitation and control of ground forces will include mandatory disclosure of the location of all weapons and troops at the time the agreement became effective. The validity of the disclosure could be checked by a thorough search and inspection. The general veracity of the disclosure would be confirmed by intelligence information. It should be recalled that the search and inspection procedure would be looking for deviations from the disclosed information and not necessarily for a complete knowledge of all violations. This makes the task of search and verification easier than if its problem were to find all the elements of a military organization. Simultaneously it makes serious violations risky for the perpetrator.

Once the forces have been reduced to the required level, it will require periodic surveillance to be sure they are not being augmented. Here again, full disclosure, monitored by random sampling, will simplify the task. Factory monitoring for heavy arms production should also aid in keeping abreast. If ground forces are prohibited or limited to certain areas, the inspection system will still have a relatively simple task.

Inspection, then, is not the serious problem in controlling ground forces. Neither will it be difficult to put such controls into effect--personnel in excess of agreed upon numbers would be demobilized and any surplus equipment would either be destroyed or impounded under the supervision of the international control force. What will be difficult is to decide the size of any residual ground force, the weapons it should be permitted, and the limitations to be placed upon their deployment.

In general, the minimum force levels will be set by the need to provide stability in the resulting system. The forces required to do this are modest. A half million troops in Western forces and a similar number in the Warsaw pact group would probably be more than ample if adequate inspection were permitted.

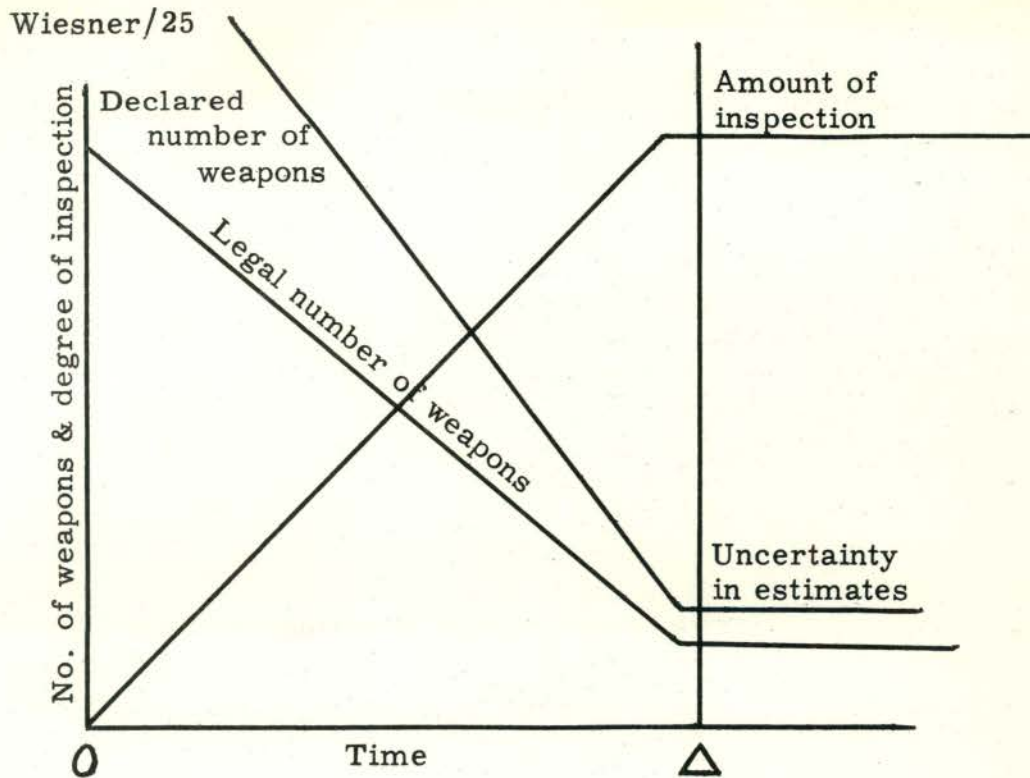
In the absence of a U.N. military organization, many observers believe that in the transition stage, going from where we are today to the final force levels, European security against aggression by conventional forces should be guaranteed by indigenous forces preferably under the authority of some supra-national organization.

The force size could be most anything above the critical size for stability and would probably be determined more by the internal security problems of the Warsaw pact countries than any other factor. It is impossible to predict how small a force they would accept, though the Soviet Union has previously proposed total bloc forces--i.e., totals on both sides--of the order of two million men. Since these proposals included all military personnel, it is conceivable that about one million ground troops on each side would be accepted by them and possibly something like half this number could be achieved ultimately. If half the total number were allocated to Europe, this would mean a European force of 250,000 to 500,000 men--so large that an inspection system of the type proposed would be able to detect major increases in its size.

Control of Research and Development--If the world were open, if scientific activity were open, unclassified, freely exchanged and published, security from new developments and technological surprise would not be a matter for serious concern. Today it is an important problem. But even during the hostile secrecy of cold war as much scientific exchange as possible would reduce the dangers. For the rest, one must rely on an intelligence system, and on what one learns from one's own research program. One can also attempt to anticipate hostile developments by developing new defenses.

In an arms-limitation environment the techniques of production inspection previously discussed can be applied to surveillance of research and development laboratories and of weapons test facilities. The inspection of such facilities, however, may pose unique problems for the West because of the traditions of free enterprise, including secrecy.

Some protection against serious consequences of technological surprise lies in the fact that weapons need not only be conceived and developed but tested, manufactured and deployed. The latter activities are usually easier to observe than the former. Any new weapon would almost certainly have to be manufactured and deployed in substantial quantities to be decisive in surprise attack. For example, the statement has often been made that the development of an effective anti-ballistic missile defense system would radically alter the balance of power and give a conclusive advantage to the



country developing it. The situation is not quite that dangerous.

First of all, an anti-missile system needs very large radars, large computers, and large rockets. It is unlikely that it could be tested in complete secrecy, even without any inspection effort. No nation could build and deploy an effective large-scale missile defense system without its being seen, and deployment would probably take several years. This is doubtless an extreme case. One can imagine important weapons systems which are not so massive, but it is not easy to conceive of the production and deployment of any decisive military capability in an environment that includes effective search and inspection.

Technological surprise in a disarmed world is often raised as a particular danger, but this problem would be much less serious in an adequately-monitored disarmed world than in a world locked in an intensive arms race.

Phasing For Security

A basic problem in the implementation of an arms-control inspection system (assuming the will to do it) is finding a way to decrease armaments and build up the inspection system without creating a hazardous military situation for any of the participating

members during the transition period. To be specific, the Western powers are unwilling to drastically reduce their military power without an effective inspection and control system. The Soviet bloc, on the other hand, regards an inspection system on their territory as a major military concession and has been unwilling to agree to it without a substantial reduction in armaments.

This difficulty can be overcome, as already intimated, only through some phasing scheme which relates the degree of inspection at any time to the amount of disarmament achieved. As previously indicated, the uncertainty associated with an inspection system is a matter of degree: the more intense the inspection, the less the uncertainty regarding its ability to monitor accurately the objects under surveillance. With adequate preparation it should be possible to design a system capable of reducing the likely errors to any level desired. The level would be determined by the risk one is prepared to run or the size of compensating deterrent forces to be permitted.

The nature of the phasing problem can be shown on the accompanying graph. Assume that the final inspection system is defined, and that the uncertainty in its ability to measure accurately the size of the force being inspected is represented by the lower line at the right of the diagram and that the inspection effort is represented by the upper line. At the beginning of the implementation period (0) when no inspection has taken place, the only information available will be from intelligence sources, and the possible error will be very large as shown. As the inspection system is developed, the probable error of the inspection system will decrease, and consequently the size of the legal force can be decreased with safety, which in turn will permit an increase in the inspection effort, etc. In this diagram the final level of the legal force is actually allowed to become smaller than the possible error. In certain situations this would be tolerable; in others it would not. For example, if the weapons represented by the graph were absolutely secure deterrent missiles, within limits, the relative number would not be a matter of much consequence and numerical equality with a possible clandestine force would not be necessary.

While it is easy to depict the plan of a phased system, it is not so easy to balance the level of disarmament and the completeness of the inspection system during the period of transition to the final conditions. One interesting method of combining time-phased arms reduction with an inspection system is based upon the concept of territorial disarmament proposed by D. L. B. Sohn.⁹ He proposes

⁹ Sohn, Phasing of Arms Controls: The Territorial Method, Summer Study on Arms Control, 1960, American Academy of Arts and Sciences, p. 265.

that thorough ground inspection (to implement other inspection techniques) begin in only one area of each inspected country and be extended to other areas by stages; the inspecting authority would decide where to inspect at each stage, without warning or any predictable basis for its selection.

If this method of territorial disarmament were used, it might be desirable to start with a relatively small proportion of the territory, and to increase each year the size of the zones in such a way that the whole process could be finished nevertheless in an agreed upon period, for example, six years. This could be accomplished, for instance by demilitarizing 5 per cent in the first year, and the remaining 25 per cent in the second year, 15 per cent in the third year, 20 per cent in the fourth year, 25 per cent in the fifth year, and the remaining 25 per cent in the sixth year. The process of disarmament here proposed should not extend over a long period, as there would be temptation to avoid the restrictions by increasing armaments and facilities for their production in the territory not subject to control. This temptation would disappear if a state knew it would lose the new armaments or facilities anyway a year or so thereafter.

Another difficulty might arise with respect to the way in which demilitarization zones should be delimited. Instead of completely random selection of areas to be inspected, one could start perhaps with the zone furthest removed from the nation's capital and proceed through consecutive stages to the capital zone. Or, one could start with a zone containing the geographical center of the country and then proceed, alternately, to zones on the east and west of it until the opposite boundaries of the nation were reached.

As another alternative, one could take into account the fact that the nations might want to keep their military forces on the boundaries until the last minute, and one could start with a set of concentric circles beginning at the geographical center of the country and extending circle by circle, by equal distances toward all the boundaries, until in the last stage the boundary zones would be demilitarized. This last method would, incidentally, result in the gradual increase in the size of zones subject to inspection. But it could be argued that anyone of these automatic methods might at some point cause a critical lack of balance between the two blocs and that it might be preferable to let each party choose the parts of its territory which would be subject to demilitarization and supervision. As each party would start with least important areas, and as more important areas would be subjected to demilitarization and supervision in a simultaneous manner, the risk involved would

greatly diminish. Under this method, complete demilitarization of a particular part of the territory of each participant would be accompanied by complete control over the demilitarized territory. By successive stages, in one part of the territory after another, disarmament and control would be extended simultaneously to the rest of the territory of all the participants.

Various proposals for disengagement have contained suggestions for disarmament zones in Central Europe. They were rejected principally because they would discriminate against Germany and perpetuate its division. These objections could not be raised with respect to proposals applicable to all states equally.

The suggested method of progressive territorial demilitarization must apply therefore to all states. But to simplify the explanation of this approach, the following analysis will be confined primarily to the United States and the Soviet Union. Once an equitable method is formed for them, it should not be too difficult to apply to other states as well.

As we have seen, there are various ways of approaching territorial demilitarization, and their relative merits will have to be carefully considered. The following suggestions are submitted only as illustrations of some of the possible approaches.

Assuming that we consider the four-year period proposed by the Soviet Union (Mr. Khrushchev's proposal for General and Complete Disarmament) as too short, and would prefer at least a six-year period, the territories of the United States and the Soviet Union could be divided, by agreement, into six equal parts. Over six years both disarmament and control would be introduced to one part after another, either by random selection or by agreement. In the first year, all arms and military installations in the first disarmament zone would be destroyed or surrendered to the United Nations. All factories in that zone would have to cease manufacturing new weapons. All nuclear energy activities would be subject to a United Nations control. And the military forces in the zone would be reduced to the level needed for the maintenance of internal order. This process would be extended in the second year to the second zone, and so on.

While it is conceivable that in the first stages a large amount of equipment and military personnel would be moved into zones not subject to control, random selection would make this more difficult, and with the progress of disarmament the room for transfer would be so diminished that a state would not be able to do this. The controls proposed long ago by the Soviet Union with respect to road junctions, railroad centers, and airports might provide sufficient guarantees

against such transfers. Alternatively, each state might be obliged to submit a list of all its military forces, military installations, stocks of armaments and nuclear materials, and facilities for the production of armaments and nuclear materials, together with a general breakdown of its forces, materials and facilities by the six zones. Although there would be no general check on the accuracy of the information thus supplied, both sides might permit the supervision of the borders between the zones in order to ensure that no forces or materials are moved from one zone to another. Such limited inspection would not be out of proportion to the amount of disarmament envisaged by these proposals.

Instead of devising zones for each state, it might be preferable to lump together all the territories of the parties to the NATO and Warsaw treaties, and to start disarmament simultaneously from the line of division in Europe and the Bering Sea. Thus, the area between the East-West boundary in Europe and the Atlantic boundary of Portugal would be divided into six zones simultaneously with the area between the East-West boundary and the Ural boundary of European Russia. Similarly, the area of Canada and the United States (including Alaska) on the one hand, would be divided into six zones. Disarmament would proceed simultaneously in all four groups of territories, starting respectively with the zones which are near to the East-West line in Europe and the Bering Sea.

There is no doubt that each method of disarmament contains some risks, and territorial demilitarization is not free from them. It may be hoped, however, that this method might be refined to the point where the twin dangers of evasion and of disturbing the existing military balance would be minimized. Once this is accomplished, the territorial demilitarization method would seem to have a better chance of acceptance than other disarmament plans, as it is the only method in which control and disarmament go hand in hand. The controversy between the United States and the Soviet Union over the crucial question of priority of controls would thus be avoided.

Conclusion

The hope for disarmament in a context of acute distrust between powerful nations lies in solutions to the problems of inspection. Much remains to be done to explore new methods and new systems of detection and verification. The problems are complicated by the fact that in themselves some controls--for example, restrictions on nuclear stockpiles--are not subject to effective inspection. And no practicable system of inspection can achieve the certainty which some seem to expect. But if certainty that there are absolutely no violations is impossible to achieve, confidence that there is no serious violation can be achieved. And, we have shown, various forms of inspection for different controls can be

combined into a system of controlled disarmament with substantial confidence and sufficient security against the dangers of violation.

These suggestions do not contemplate reliance on "good faith." They indicate systems that would make it extremely unlikely that any nation would find it desirable and feasible to violate, systems whereby no serious violation would escape detection. These systems of inspected controls, I believe, would not entail danger to the nation's security, and any small abiding risks in them would be far smaller than the different risks involved in an uncontrolled arms race.