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# The Delicate Balance of Terror

ALBERT WOHLSTETTER

Condensed from *Foreign Affairs*

January, 1959

*In an article which has received wide attention throughout the world, a member of the Rand Corporation here challenges the generally accepted view that the strategic balance between East and West has reached, and will maintain, a position of equilibrium. (By special permission from Foreign Affairs, January 1959. Copyright by Council on Foreign Relations, New York)*

THE first shock administered by the Soviet launching of sputnik has almost dissipated. The flurry of statements and investigations and improvised responses has died down, leaving a small residue: a slight increase in the schedule of bomber and ballistic missile production, with a resulting small increment in our defense expenditures for the current fiscal year; a considerable enthusiasm for space travel; and some stirrings of interest in the teaching of mathematics and physics in the secondary schools. Western defense policy has almost returned to the level of activity and the emphasis suited to the basic assumptions which were controlling before sputnik.

One of the most important of these assumptions – that a general thermonuclear war is extremely unlikely – is held in common by most of the critics of our defense policy as well as by its proponents. Because of its crucial role in the Western strategy of defense, I should like to examine the stability of the thermonuclear balance which, it is generally supposed, would make aggression irrational or even insane. The balance, I believe, is in fact precarious, and this fact has critical implications for policy. Deterrence in the 1960s is neither assured nor impossible but will be the product of sustained intelligent effort and hard choices, responsibly made. As a major illustration important both for defense and foreign policy, I shall treat the particularly stringent conditions for deterrence which affect forces based close to the enemy, whether they are U.S. forces or those of our allies, under single or joint control. I shall comment also on the inadequacy as well as the necessity

of deterrence, on the problem of accidental outbreak of war, and on disarmament.

## The Presumed Automatic Balance

I emphasize that requirements for deterrence are stringent. We have heard so much about the atomic stalemate and the receding probability of war which it has produced that this may strike the reader as something of an exaggeration. Is deterrence a necessary consequence of both sides having a nuclear delivery capability, and is all-out war nearly obsolete? Is mutual extinction the only outcome of a general war? This belief, frequently expressed by references to Mr. Oppenheimer's simile of the two scorpions in a bottle, is perhaps the prevalent one. . . .

Deterrence, however, is not automatic. While feasible, it will be much harder to achieve in the 1960s than is generally believed. One of the most disturbing features of current opinion is the underestimation of this difficulty. This is due partly to a misconception of the technological race as a problem in matching striking forces, partly to a wishful analysis of the Soviet ability to strike first.

Since sputnik, the United States has made several moves to assure the world (that is, the enemy, but more especially our allies and ourselves) that we will match or overmatch Soviet technology and, specifically, Soviet offense technology. We have, for example, accelerated the bomber and ballistic missile programs, in particular the intermediate-range ballistic missiles. The problem has been conceived as more or better bombers – or rockets; or sputniks; or

engineers. This has meant confusing deterrence with matching or exceeding the enemy's ability to strike first. Matching weapons, however, misconstrues the nature of the technological race. Not, as is frequently said, because only a few bombs owned by the defender can make aggression fruitless, but because even many might not. One outmoded A-bomb dropped from an obsolete bomber might destroy a great many supersonic jets and ballistic missiles. To deter an attack means being able to strike back in spite of it. It means, in other words, a capability to strike second. In the last year or two there has been a growing awareness of the importance of the distinction between a 'strike-first' and a 'strike-second' capability, but little, if any, recognition of the implications of this distinction for the balance of terror theory.

Where the published writings have not simply underestimated Soviet capabilities and the advantages of a first strike, they have in general placed artificial constraints on the Soviet use of the capabilities attributed to them. They assume, for example, that the enemy will attack in mass over the Arctic through our Distant Early Warning line, with bombers refueled over Canada – all resulting in plenty of warning. Most hopefully, it is sometimes assumed that such attacks will be preceded by days of visible preparations for moving ground troops. Such assumptions suggest that the Soviet leaders will be rather bumbling or, better, co-operative. However attractive it may be for us to narrow Soviet alternatives to these, they would be low in the order of preference of any reasonable Russians planning war.

### **The Quantitative Nature of the Problem and the Uncertainties**

In treating Soviet strategies it is important to consider Soviet rather than Western advantage and to consider the strategy of both sides quantitatively. The effectiveness of our own choices will depend on a most complex numerical interaction of Soviet and Western plans. Unfortunately, both the privileged and unprivileged information on these matters is precarious. As a result, competent people have been led into critical error in evaluating the prospects for deterrence. Western journalists have greatly overestimated the difficulties of a Soviet surprise attack with thermonuclear

weapons and vastly underestimated the complexity of the Western problem of retaliation. . . .

Perhaps the first step in dispelling the nearly universal optimism about the stability of deterrence would be to recognize the difficulties in analyzing the uncertainties and interactions between our own wide range of choices and the moves open to the Soviets. On our side we must consider an enormous variety of strategic weapons which might compose our force, and for each of these several alternative methods of basing and operation. These are the choices that determine whether a weapons system will have any genuine capability in the realistic circumstances of a war. Besides the B-47E and the B-52 bombers which are in the United States strategic force now, alternatives will include the B-52G (a longer-range version of the B-52); the Mach 2 B-58A bomber and a 'growth' version of it; the Mach 3 B-70 bomber; a nuclear-powered bomber possibly carrying long-range air-to-surface missiles; the Dynasoar, a manned glide-rocket; the Thor and the Jupiter, liquid-fueled intermediate-range ballistic missiles; the Snark intercontinental cruise missile; the Atlas and the Titan intercontinental ballistic missiles; the submarine-launched Polaris and Atlantis rockets; and Minuteman, one potential solid-fueled successor to the Thor and Titan; possibly unmanned bombardment satellites; and many others which are not yet gleams in anyone's eye and some that are just that.

The difficulty of describing in a brief article the best mixture of weapons for the long-term future beginning in 1960, their base requirements, their potentiality for stabilizing or upsetting the balance among the great powers, and their implications for the alliance, is not just a matter of space or the constraint of security. The difficulty in fact stems from some rather basic insecurities. These matters are widely uncertain; we are talking about weapons and vehicles that are some time off and, even if the precise performances currently hoped for and claimed by contractors were in the public domain, it would be a good idea to doubt them.

Recently some of my colleagues picked their way through the graveyard of early claims about various missiles and aircraft: their dates of availability, costs and performance. These claims are seldom revisited or talked about: *de mortuis nil nisi bonum*. The errors were large and almost always in one direction. And the less we

knew, the more hopeful we were. Accordingly the missiles benefited in particular. For example, the estimated cost of one missile increased by a factor of over 50 – from about \$35,000 in 1949 to some \$2 million in 1957. This uncertainty is critical. Some but not all of the systems listed can be chosen and the problem of choice is essentially quantitative. The complexities of the problem, if they were more widely understood, would discourage the oracular confidence of writers on the subject of deterrence.

Some of the complexities can be suggested by referring to the successive obstacles to be hurdled by any system providing a capability to strike second, that is, to strike back. Such deterrent systems must have (a) a stable, 'steady-state' peacetime operation within feasible budgets (beside the logistic and operational costs there are, for example, problems of false alarms and accidents). They must have also the ability (b) to survive enemy attacks, (c) to make and communicate the decision to retaliate, (d) to reach enemy territory with fuel enough to complete their mission, (e) to penetrate enemy active defenses, that is, fighters and surface-to-air missiles, and (f) to destroy the target in spite of any 'passive' civil defense in the form of dispersal or protective construction or evacuation of the target itself.

Within limits the enemy is free to use his offensive and defensive forces so as to exploit the weaknesses of each of our systems. He will also be free, within limits, in the 1960s to choose that composition of forces which will make life as difficult as possible for the various systems we might select. It would be quite wrong to assume that we have the same degree of flexibility or that the uncertainties I have described affect a totalitarian aggressor and the party attacked equally. A totalitarian country can preserve secrecy about the capabilities and disposition of his forces very much better than a Western democracy. And the aggressor has, among other enormous advantages of the first strike, the ability to weigh continually our performance at each of the six barriers and to choose that precise time and circumstance for attack which will reduce uncertainty. It is important not to confuse our uncertainty with his. Strangely enough, some military commentators have not made this distinction and have founded their certainty of deterrence on the fact simply that there are uncertainties. . . .

### The Delicacy of the Balance of Terror

The most important conclusion is that we must expect a vast increase in the weight of attack which the Soviets can deliver with little warning, and the growth of a significant Russian capability for an essentially warningless attack. As a result, strategic deterrence, while feasible, will be extremely difficult to achieve, and at critical junctures in the 1960s, we may not have the power to deter attack. Whether we have it or not will depend on some difficult strategic choices as to the future composition of the deterrent forces as well as hard choices on its basing, operations and defense.

Manned bombers will continue to make up the predominant part of our striking force in the early 1960s. None of the popular remedies for their defense will suffice – not, for example, mere increase of alertness (which will be offset by the Soviet's increasing capability for attack without significant warning), nor simple dispersal or sheltering alone or mobility taken by itself, nor a mere piling up of interceptors and defense missiles around s.a.c. bases. Especially extravagant expectations have been placed on the airborne alert – an extreme form of defense by mobility. The impression is rather widespread that one-third of the s.a.c. bombers are in the air and ready for combat at all times. This belief is belied by the public record. According to the Symington Committee Hearings in 1956, our bombers averaged 31 hours of flying per month, which is about four per cent of the average 732-hour month. An Air Force representative expressed the hope that within a couple of years, with an increase in the ratio of crews to aircraft, the bombers would reach 45 hours of flight per month – which is six per cent. This four to six per cent of the force includes bombers partially fueled and without bombs. It is, moreover, only an average, admitting variance down as well as up. Some increase in the number of armed bombers aloft is to be expected. However, for the current generation of bombers, which have been designed for speed and range rather than endurance, a continuous air patrol for one-third of the force would be extremely expensive.

On the other hand, it would be unwise to look for miracles in the new weapons systems, which by the mid-1960s may constitute a considerable portion of the United States force. After the Thor, Atlas and Titan there are a

number of promising developments. The solid-fueled rockets, Minuteman and Polaris, promise in particular to be extremely significant components of the deterrent force. Today they are being touted as making the problem of deterrence easy to solve and, in fact, guaranteeing its solution. But none of the new developments in vehicles is likely to do that. For the complex job of deterrence, they all have limitations. The unvaryingly immoderate claims for each new weapons system should make us wary of the latest 'technological breakthroughs'. Only a very short time ago the ballistic missile itself was supposed to be intrinsically invulnerable on the ground. It is now more generally understood that its survival is likely to depend on a variety of choices in its defense.

It is hard to talk with confidence about the mid and late-1960s. A systematic study of an optimal or a good deterrent force which considered all the major factors affecting choice and dealt adequately with the uncertainties would be a formidable task. In lieu of this, I shall mention briefly why none of the many systems available or projected dominates the others in any obvious way. My comments will take the form of a swift run-through of the characteristic advantages and disadvantages of various strategic systems at each of the six successive hurdles mentioned earlier.

The first hurdle to be surmounted is the attainment of a stable, steady-state peacetime operation. Systems which depend for their survival on extreme decentralization of controls, as may be the case with large-scale dispersal and some of the mobile weapons, raise problems of accidents and over a long period of peacetime operation this leads in turn to serious political problems. Systems relying on extensive movement by land, perhaps by truck caravan, are an obvious example; the introduction of these on European roads, as is sometimes suggested, would raise grave questions for the governments of some of our allies. Any extensive increase in the armed air alert will increase the hazard of accident and intensify the concern already expressed among our allies. Some of the proposals for bombardment satellites may involve such hazards of unintended bomb release as to make them out of the question.

The cost to buy and operate various weapons systems must be seriously considered. Some systems buy their ability to negotiate a given

hurdle – say, surviving the enemy attack – only at prohibitive cost. Then the number that can be bought out of a given budget will be small and this will affect the relative performance of competing systems at various other hurdles, for example penetrating enemy defenses. Some of the relevant cost comparisons, then, are between competing systems; others concern the extra costs to the enemy of canceling an additional expenditure of our own. For example, some dispersal is essential, though usually it is expensive; if the dispersed bases are within a warning net, dispersal can help to provide warning against some sorts of attack, since it forces the attacker to increase the size of his raid and so makes it more liable to detection as well as somewhat harder to co-ordinate. But as the sole or principal defense of our offensive force, dispersal has only a brief useful life and can be justified financially only up to a point. For against our costs of construction, maintenance and operation of an additional base must be set the enemy's much lower costs of delivering one extra weapon. And, in general, any feasible degree of dispersal leaves a considerable concentration of value at a single target point. For example, a squadron of heavy bombers costing, with their associated tankers and penetration aids, perhaps \$500,000,000 over five years, might be eliminated, if it were otherwise unprotected, by an enemy intercontinental ballistic missile costing perhaps \$16,000,000. After making allowance for the unreliability and inaccuracy of the missile, this means a ratio of some ten for one or better. To achieve safety by *brute* numbers in so unfavorable a competition is not likely to be viable economically or politically. However, a viable peacetime operation is only the first hurdle to be surmounted.

At the second hurdle – surviving the enemy offense – ground alert systems placed deep within a warning net look good against a manned bomber attack, much less good against intercontinental ballistic missiles, and not good at all against ballistic missiles launched from the sea. In the last case, systems such as the Minuteman, which may be sheltered and dispersed as well as alert, would do well. Systems involving launching platforms which are mobile and concealed, such as Polaris submarines, have particular advantage for surviving an enemy offense.

However, there is a third hurdle to be surmounted – namely that of making the decision

to retaliate and communicating it. Here, Polaris, the combat air patrol of B-52s, and in fact all of the mobile platforms – under water, on the surface, in the air and above the air – have severe problems. Long distance communication may be jammed and, most important, communication centers may be destroyed.

At the fourth hurdle – ability to reach enemy territory with fuel enough to complete the mission – several of our short-legged systems have operational problems such as co-ordination with tankers and using bases close to the enemy. For a good many years to come, up to the mid-1960s in fact, this will be a formidable hurdle for the greater part of our deterrent force. The next section of this article deals with this problem at some length.

The fifth hurdle is the aggressor's long-range interceptors and close-in missile defenses. To get past these might require large numbers of planes and missiles. (If the high cost of overcoming an earlier obstacle – using extreme dispersal or airborne alert or the like – limits the number of planes or missiles bought, our capability is likely to be penalized disproportionately here.) Or getting through may involve carrying heavy loads of radar decoys, electronic jammers and other aids to defense penetration. For example, vehicles like Minuteman and Polaris, which were made small to facilitate dispersal or mobility, may suffer here because they can carry fewer penetration aids.

At the final hurdle – destroying the target in spite of the passive defenses that may protect it – low-payload and low-accuracy systems, such as Minuteman and Polaris, may be frustrated by blast-resistant shelter. For example, five half-megaton weapons with an average inaccuracy of two miles might be expected to destroy half the population of a city of 900,000, spread over forty square miles, provided the inhabitants are without shelters. But if they are provided with shelters capable of resisting over-pressures of 100 pounds per square inch, approximately sixty such weapons would be required; and deep rock shelters might force the total up to over a thousand.

Prizes for a retaliatory capability are not distributed for getting over one of these jumps. A system must get over all six. I hope these illustrations will suggest that assuring ourselves the power to strike back after a massive thermonuclear surprise attack is

by no means as automatic as is widely believed.

In counteracting the general optimism as to the ease and, in fact, the inevitability of deterrence, I should like to avoid creating the extreme opposite impression. Deterrence demands hard, continuing, intelligent work, but it can be achieved. The job of deterring rational attack by guaranteeing great damage to an aggressor is, for example, very much less difficult than erecting a nearly airtight defense of cities in the face of full-scale thermonuclear surprise attack. Protecting manned bombers and missiles is much easier because they may be dispersed, sheltered or kept mobile, and they can respond to warning with greater speed. Mixtures of these and other defenses with complementary strengths can preserve a powerful remainder after attack. Obviously not all our bombers and missiles need to survive in order to fulfill their mission. To preserve the majority of our cities intact in the face of surprise attack is immensely more difficult, if not impossible. (This does not mean that the aggressor has the same problem in preserving his cities from retaliation by a poorly-protected, badly-damaged force. And it does not mean that *we* should not do more to limit the extent of the catastrophe to our cities in case deterrence fails. I believe we should.) Deterrence, however, provided we work at it, is feasible, and, what is more, it is a crucial objective of national policy.

What can be said, then, as to whether general war is unlikely? Would not a general thermonuclear war mean 'extinction' for the aggressor as well as the defender? 'Extinction' is a state that badly needs analysis. Russian casualties in World War II were more than 20,000,000. Yet Russia recovered extremely well from this catastrophe. There are several quite plausible circumstances in the future when the Russians might be quite confident of being able to limit damage to considerably less than this number – they make sensible strategic choices and we do not. On the other hand, the risks of not striking might at some juncture appear very great to the Soviets, involving, for example, disastrous defeat in peripheral war, loss of key satellites with danger of revolt spreading – possibly to Russia itself – or fear of an attack by ourselves. Then, striking first, by surprise, would be the sensible choice for them, and from their point of view the smaller risk.

It should be clear that it is not fruitful to talk

about the likelihood of general war without specifying the range of alternatives that are pressing on the aggressor and the strategic postures of both the Soviet bloc and the West. Deterrence is a matter of comparative risks. The balance is not automatic. First, since thermonuclear weapons give an enormous advantage to the aggressor, it takes great ingenuity and realism at any given level of nuclear technology to devise a stable equilibrium. And second, this technology itself is changing with fantastic speed. Deterrence will require an urgent and continuing effort.

### The Uses and Risks of Bases close to the Soviets

It may now be useful to focus attention on the special problems of deterrent forces close to the Soviet Union. First, overseas areas have played an important role in the past and have a continuing though less certain role today. Second, the recent acceleration of production of intermediate-range ballistic missiles and the negotiation of agreements with various N.A.T.O. powers for their basing and operation have given our overseas bases a renewed importance in deterring attack on the United States – or so it would appear at first blush. Third, an analysis can throw some light on the problems faced by our allies in developing an independent ability to deter all-out attack on themselves, and in this way it can clarify the much agitated question of nuclear sharing. Finally, overseas bases affect in many critical ways, political and economic as well as military, the status of the alliance.

At the end of the last decade, overseas bases appeared to be an advantageous means of achieving the radius extension needed by our short-legged bombers, of permitting them to use several axes of attack, and of increasing the number of sorties possible in the course of an extended campaign. With the growth of our own thermonuclear stockpile, it became apparent that a long campaign involving many re-uses of a large proportion of our bombers was not likely to be necessary. With the growth of a Russian nuclear-delivery capability, it became clear that this was most unlikely to be feasible.

Our overseas bases now have the disadvantage of high vulnerability. Because they are closer than the United States to the Soviet Union, they are subject to a vastly greater attack by a larger variety as well as number of

vehicles. With given resources, the Soviets might deliver on nearby bases a freight of bombs with something like fifty to one hundred times the yield that they could muster at intercontinental range. Missile accuracy would more than double. Because there is not much space for obtaining warning – in any case, there are no deep-warning radar nets – and, since most of our overseas bases are close to deep water from which submarines might launch missiles, the warning problem is very much more severe than for bases in the interior of the United States.

As a result, early in the 1950s the U.S. Air Force decided to recall many of our bombers to the continental United States and to use the overseas bases chiefly for refueling, particularly post-strike ground refueling. This reduced drastically the vulnerability of U.S. bombers and at the same time retained many of the advantages of overseas operation. For some years now S.A.C. has been reducing the number of aircraft usually deployed overseas. The purpose is to reduce vulnerability and has little to do with any increasing radius of S.A.C. aircraft. The early B-52 radius is roughly that of the B-36; the B-47, roughly that of the B-50 or B-29. In fact the radius limitation and therefore the basing requirements we have discussed will not change substantially for some time to come. We can talk with comparative confidence here, because the U.S. strategic force is itself largely determined for this period. Such a force changes more slowly than is generally realized. The vast majority of the force will consist of manned bombers, and most of these will be of medium range. *Some* U.S. bombers will be able to reach *some* targets from *some* U.S. bases within the forty-eight states without landing on the way back. On the other hand, some bomber-target combinations are not feasible without pre-target landing (and are therefore doubtful). The Atlas, Titan and Polaris rockets, when available, can of course do without overseas bases (though the proportion of Polaris submarines kept at sea can be made larger by the use of submarine tenders based overseas). But even with the projected force of aerial tankers, the greater part of our force, which will be manned bombers, cannot be used at all in attacks on the Soviet Union without at least some use of overseas areas.

What of the bases for Thor and Jupiter, our first intermediate-range ballistic missiles? These

have to be close to the enemy, and they must of course be operating bases, not merely refueling stations. The Thors and Jupiters will be continuously in range of an enormous Soviet potential for surprise attack. These installations therefore re-open, in a most acute form, some of the serious questions of ground vulnerability that were raised about six years ago in connection with our overseas bomber bases. The decision to station the Thor and Jupiter missiles overseas has been our principal public response to the Russian advances in rocketry, and perhaps our most plausible response. Because it involves our ballistic missiles it appears directly to answer the Russian rockets. Because it involves using European bases, it appears to make up for the range superiority of the Russian intercontinental missile. And most important, it directly involves the N.A.T.O. powers and gives them an element of control.

There is no question that it was genuinely urgent not only to meet the Russian threat but to do so visibly, in order to save the loosening N.A.T.O. alliance. Our allies were fearful that the Soviet ballistic missiles might mean that we were no longer able or willing to retaliate against the Soviet Union in case of an attack on them. We hastened to make public a reaction which would restore their confidence. This move surely appears to increase our own power to strike back, and also to give our allies a deterrent of their own, independent of our decision. It has also been argued that in this respect it merely advances the inevitable date at which our allies will acquire 'modern' weapons of their own, and that it widens the range of Soviet challenges which Europe can meet. But we must face seriously the question whether this move will in fact assure either the ability to retaliate or the decision to attempt it, on the part of our allies or ourselves. And we should ask at the very least whether further expansion of this policy will buy as much retaliatory power as other ways of spending the considerable sums involved. Finally, it is important to be clear whether the Thor and Jupiter actually increase the flexibility or range of response available to our allies.

One justification for this move is that it disperses retaliatory weapons and that this is the most effective sanction against the thermonuclear aggressor. The limitations of dispersal have already been discussed, but it remains to examine the argument that overseas bases pro-

vide *widespread* dispersal, which imposes on the aggressor insoluble problems of co-ordination.

There is of course something in the notion that forcing the enemy to attack many political entities increases the seriousness of his decision, but there is very little in the notion that dispersal in several countries makes the problem of destruction more difficult in the military sense. Dispersal does not require separation by the distance of oceans – just by the lethal diameters of enemy bombs. And the task of co-ordinating bomber attacks on Europe and the eastern coast of the United States, say, is not appreciably more difficult than co-ordinating attacks on our east and west coasts. In the case of ballistic missiles, the elapsed time from firing to impact on the target can be calculated with high accuracy. Although there will be some failures and delays, times of firing can be arranged so that impact on many dispersed points is almost simultaneous – on Okinawa and the United Kingdom, for instance, as well as on California and Ohio. Moreover, it is important to keep in mind that these far-flung bases, while distant from each other and from the United States, are on the whole close to the enemy. To eliminate them, therefore, requires a smaller expenditure of resources on his part than targets at intercontinental range. For close-in targets he can use a wider variety of weapons carrying larger payloads and with higher accuracy.

The seeming appositeness of an overseas-based Thor and Jupiter as an answer to a Russian intercontinental ballistic missile stems not so much from any careful analysis of their retaliatory power under attack as from the directness of the comparison they suggest: a rocket equals a rocket, an intercontinental missile equals an intermediate-range missile based at closer range to the target. But this again mistakes the nature of the technological race. It conceives the problem of deterrence as that of simply matching or exceeding the aggressor's capability to strike first. . .

The basis for the hopeful impression that they will not is rather vague, including a mixture of hypothetical properties of ballistic missiles in which perhaps the dominant element is their supposedly much more rapid, 'push-button' response. What needs to be considered here are the response time of such missiles (including decision, preparation and launch times), and how they are to be defended.



The decision to fire a missile with a thermonuclear warhead is much harder to make than a decision simply to start a manned aircraft on its way, with orders to return to base unless instructed to continue to its assigned target. This is the 'fail-safe' procedure practised by the U.S. Air Force. In contrast, once a missile is launched, there is no method of recall or deflection which is not subject to risks of electronic or mechanical failure. Therefore such a decision must wait for much more unambiguous evidence of enemy intentions. It must and will take a longer time to make and is less likely to be made at all. Where more than one country is involved, the joint decision is harder still, since there is opportunity to disagree about the ambiguity of the evidence, as well as to reach quite different interpretations of national interest. On much less momentous matters the process of making decisions in N.A.T.O. is complicated, and it should be recognized that such complexity has much to do with the genuine concern of the various N.A.T.O. powers about the danger of accidentally starting World War III. Such fears will not be diminished with the advent of I.R.B.M.'s. In fact, widespread dispersion of nuclear armed missiles raises measurably the possibility of accidental war.

Second, it is quite erroneous to suppose that by contrast with manned bombers the first I.R.B.M.'s can be launched almost as simply as pressing a button. Count-down procedures for early missiles are liable to interruption, and the characteristics of the liquid oxygen fuel limits the readiness of their response. Unlike JP-4, the fuel used in jet bombers, liquid oxygen cannot be held for long periods of time in these vehicles. In this respect such missiles will be *less* ready than alert bombers. Third, the smaller warning time available overseas makes more difficult any response. This includes, in particular, any active *défense*, not only against ballistic missile attacks but, for example, against low altitude or various circuitous attacks by manned aircraft.

Finally, passive defense by means of shelter is more difficult, given the larger bomb yields, better accuracies and larger forces available to the Russians at such close range. And if the press reports are correct, the plans for I.R.B.M. installations do not call for bomb-resistant shelters. If this is so, it should be taken into account in measuring the actual contribution of these installations to the West's retaliatory

power. Viewed as a contribution to deterring all-out attack on the United States, the Thor and Jupiter bases seem unlikely to compare favorably with other alternatives. If newspaper references to hard bargaining by some of our future hosts are to be believed, it would seem that such negotiations have been conducted under misapprehensions on both sides as to the benefits to the United States.

But many proponents of the distribution of Thor and Jupiter – and possibly some of our allies – have in mind not an increase in U.S. deterrence but the development of an independent capability in several of the N.A.T.O. countries to deter all-out attack against themselves. This would be a useful thing if it can be managed at supportable cost and if it does not entail the sacrifice of even more critical measures of protection. But aside from the special problems of joint control, which would affect the certainty of response adversely, precisely who their legal owner is will not affect the retaliatory power of the Thors and Jupiters one way or the other. They would not be able to deter an attack which they could not survive. It is curious that many who question the utility of American overseas bases (for example, our bomber bases in the United Kingdom) simply assume that, for our allies, possession of strategic nuclear weapons is one with deterrence.

There remains the view that the provision of these weapons will broaden the range of response open to our allies. In so far as this view rests on the belief that the intermediate-range ballistic missile is adapted to limited war, it is wide of the mark. The inaccuracy of an I.R.B.M. requires high-yield warheads, and such a combination of inaccuracy and high yield, while quite appropriate and adequate against unprotected targets in a general war, would scarcely come within even the most lax, in fact reckless, definition of limited war. Such a weapon is inappropriate for even the nuclear variety of limited war, and it is totally useless for meeting the wide variety of provocation that is well below the threshold of nuclear response. In so far as these missiles will be costly for our allies to install, operate and support, they are likely to displace a conventional capability that might be genuinely useful in limited engagements. More important, they are likely to be used as an excuse for budget cutting. In this way they will accelerate the general trend towards dependence on all-out

response and so will have the opposite effect to the one claimed.

Nevertheless, if the Thor and Jupiter have these defects, might not some future weapon be free of them? Some of these defects, of course, will be overcome in time. Solid fuels or storable liquids will eventually replace liquid oxygen, reliabilities will increase, various forms of mobility or portability will become feasible, accuracies may even be so improved that such weapons can be used in limited wars. But these developments are all years away. In consequence, the discussion will be advanced if a little more precision is given such terms as 'missiles' or 'modern' or 'advanced weapons'. We are not distributing a generic 'modern' weapon with all the virtues of flexibility in varying circumstances and of invulnerability in all-out war. But even with advances in the state of the art on our side, it will remain difficult to maintain a deterrent, especially close in under the enemy's guns.

It follows that, though a wider distribution of nuclear weapons may be inevitable, or at any rate likely, and though some countries in addition to the Soviet Union and the United States may even develop an independent deterrent, it is by no means inevitable or even very likely that the power to deter all-out thermonuclear attack will be widespread. This is true even though a minor power would not need to guarantee as large a retaliation as we in order to deter attack on itself. Unfortunately, the minor powers have smaller resources as well as poorer strategic locations.<sup>1</sup> Mere membership in the

nuclear club might carry with it prestige, as the applicants and nominees expect, but it will be rather expensive, and in time it will be clear that it does not necessarily confer any of the expected privileges enjoyed by the two charter members. The burden of deterring a general war as distinct from limited wars is still likely to be on the United States and therefore, so far as our allies are concerned, on the military alliance.

There is one final consideration. Missiles placed near the enemy, even if they could not retaliate, would have a potent capability for striking first by surprise. And it might not be easy for the enemy to discern their purpose. The existence of such a force might be a considerable provocation and in fact a dangerous one in the sense that it would place a great burden on our deterrent force which more than ever would have to guarantee extreme risks to the attacker – worse than the risks of waiting in the face of this danger. When not coupled with the ability to strike in retaliation, such a capability might suggest – erroneously, to be sure, in the case of the democracies – an intention to strike first. If so, it would tend to provoke, rather than to deter general war.

I have dealt here with only one of the functions of overseas bases: their use as a support for the strategic deterrent force. They have a variety of important military, political and economic roles which are beyond the scope of this paper. Expenditures in connection with the construction or operation of our bases, for example, are a form of economic aid and, moreover, a form that is rather palatable to the Congress. There are other functions in a central war where their importance may be very considerable and their usefulness in a limited war might be substantial.

Indeed nothing said here should suggest that deterrence is in itself an adequate strategy. . . .

But it would be a fatal mistake to suppose that because strategic deterrence is inadequate by itself it can be dispensed with. Deterrence is not dispensable. If the picture of the world I have drawn is rather bleak, it could none the less be

<sup>1</sup> General Gallois argues that, while alliances will offer no guarantee "a small number of bombs and a small number of carriers suffice for a threatened power to protect itself against atomic destruction." (*Réalités*, Nov. 1953, p. 71.) His numerical illustrations give the defender some 400 underground launching sites (*ibid.*, p. 22, and *The Reporter*, Sept. 18, 1953, p. 25) and suggest that their elimination would require 5,000 to 25,000 missiles – which is 'more or less impossible' – and that in any case the aggressor would not survive the fall-out from his own weapons. Whether these are large numbers of targets from the standpoint of the aggressor will depend on the accuracy, yield and reliability of offense weapons as well as the resistance of the defender's shelters and a number of other matters not specified in the argument. General Gallois is aware that the expectation of survival depends on distance even in the ballistic missile age and that our allies are not so fortunate in this respect. Close-in missiles have better bomb yields and accuracies. Moreover, manned aircraft – with still better yields and accuracies – can be used by an aggressor here since warning of their approach is very short. Suffice it to say that the numerical advantage General Gallois cites is greatly exaggerated. Furthermore, he exaggerates the destructiveness of the retaliatory blow against the aggressor's cities by the remnants of the defender's missile force – even assuming the aggressor would take no special measures to protect his cities. But particularly for the aggressor – who does not lack warning – a civil defense program can moderate the damage done by a poorly organized attack. Finally, the suggestion that the aggressor would not survive the fall-out from his own weapons is simply in error. The rapid-decay fission products which are the major lethal problem in the locality of a surface burst are not a serious difficulty for the aggressor. The amount of the slow-decay products, strontium-90 and cesium-137, in the atmosphere would rise

considerably. If nothing were done to counter it, this might, for example, increase by many times the incidence of such relatively rare diseases as bone cancer and leukemia. However, such a calamity, implying an increase of, say, 20,000 deaths per year for a nation of 200,000,000, is of an entirely different order from the catastrophe involving tens of millions of deaths, which General Gallois contemplates elsewhere. And there are measures that might reduce even this effect drastically. (See the Rand Corporation Report R-322-RC, *Report on a Study of Non-Military Defense*, July 1, 1953.)

cataclysmically worse. Suppose both the United States and the Soviet Union had the power to destroy each other's retaliatory forces and society, given the opportunity to administer the opening blow. The situation would then be something like the old-fashioned Western gun duel. It would be extraordinarily risky for one side *not* to attempt to destroy the other, or to delay doing so, since it not only can emerge unscathed by striking first but this is the sole way it can reasonably hope to emerge at all. Evidently such a situation is extremely unstable. On the other hand, if it is clear that the aggressor too will suffer catastrophic damage in the event of his aggression, he then has strong reason not to attack, even though he can administer great damage. A protected retaliatory capability has a stabilizing influence not only in deterring rational attack, but also in offering every inducement to both powers to reduce the chance of accidental war.

The critics who feel that deterrence is 'bankrupt' sometimes say that we stress deterrence too much. I believe this is quite wrong if it means that we are devoting too much effort to protect our power to retaliate; but I think it is quite right if it means that we have talked too much of a strategic threat as a substitute for many things it cannot replace. If there were no real danger of a rational attack, then accidents and the 'nth' country problem would be the only problems. As I have indicated, they are serious problems and some sorts of limitation and inspection agreement might diminish them. But if there is to be any prospect of realistic and useful agreement, we must reject the theory of automatic deterrence. And we must bear in mind that the more extensive a disarmament agreement is, the smaller the force that a violator would have to hide in order to achieve complete domination. Most obviously, "*the abolition of the weapons necessary in a general or 'unlimited' war*" would offer the most insuperable obstacles to an inspection plan, since the violator could gain an overwhelming advantage from the concealment of even a few weapons. The need for a deterrent, in this connection too, is ineradicable.

## Summary

Almost everyone seems concerned with the need to relax tension. However, relaxation of tension, which everyone thinks is good, is not easily distinguished from relaxing one's guard, which almost everyone thinks is bad. Relaxation, like Miltown, is not an end in itself. Not all danger comes from tension. To be tense where there is danger is only rational.

What can we say then, in sum, on the balance of terror theory of automatic deterrence? It is a contribution to the rhetoric rather than the logic of war in the thermonuclear age. The notion that a carefully planned surprise attack can be checkmated almost effortlessly, that, in short, we may resume our deep pre-sputnik sleep, is wrong and its nearly universal acceptance is terribly dangerous. Though deterrence is not enough in itself, it is vital. There are two principal points.

First, deterring general war in both the early and late 1960s will be hard at best, and hardest both for ourselves and our allies wherever we use forces based near the enemy.

Second, even if we can deter general war by a strenuous and continuing effort, this will by no means be the whole of a military, much less a foreign policy. Such a policy would not of itself remove the danger of accidental outbreak or limit the damage in case deterrence failed; nor would it be at all adequate for crises on the periphery.

A generally useful way of concluding a grim argument of this kind would be to affirm that we have the resources, intelligence and courage to make the correct decisions. That is, of course, the case. And there is a good chance that we will do so. But perhaps, as a small aid towards making such decisions more likely, we should contemplate the possibility that they may *not* be made. They *are* hard, *do* involve sacrifice, *are* affected by great uncertainties and concern matters in which much is altogether unknown and much else must be hedged by secrecy; and, above all, they entail a new image of ourselves in a world of persistent danger. It is by no means *certain* that we shall meet the test.

