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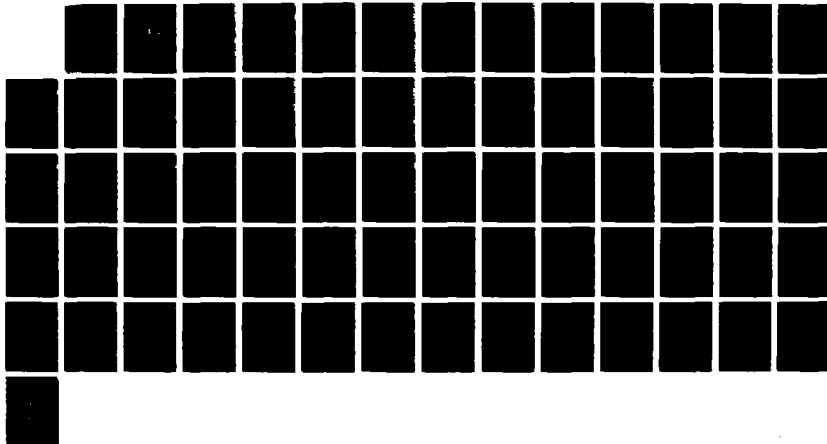
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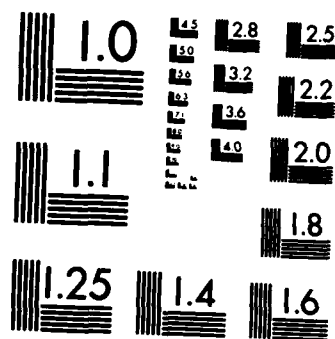
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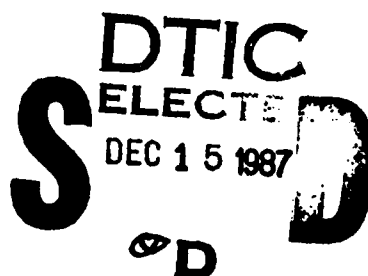
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THE STRATEGIC CONTEXT FOR ASSESSING LONG RANGE OFFENSE AND ACTIVE DEFENSE

**Pan Heuristics
A Division of R & D Associates
P.O. Box 9695
Marina del Rey, CA 90295**

27 October 1986

Technical Report



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SUMMARY

This interim report presents some of Pan Heuristics' research and tentative conclusions as of October 1986 on the items considered under Tasks 2 and 3 of its contract on "Alternative Nuclear Employment Policy/Technology." It discusses the relation between systems for attack and systems for active defense.

The report makes an integrated assessment of various courses of action and identifies critical technologies. It warns against certain forms of arms agreements, and points out the paralyzing effects of a belief in mutual assured destruction.

The consequences of nuclear proliferation are noted, especially certain unrealistic expectations by the French. The prospects for a war initiated by a third party, such as the French or British, are reviewed critically.

This interim report draws on earlier work by Professor Albert Wohlstetter and has profited from the discussions conducted under Tasks 1 and 4 of the contract.



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TABLE OF CONTENTS

Section

	Summary	iii
1	Introduction	1
2	Western Ways of Looking at Offense, Defense and Arms Control	2
3	The Extremes Meet: Pure Defense and Pure Offense	8
4	The Incompatibility of MAD with U.S. Guarantees to Allies	11
5	The Inadequacy of Bipolar Models of Stability	14
6	The Improved Prospects for Defense, for Discriminating Offense and for Keeping Destruction Under Control	20
7	The Paralyzing Effects of Arms Race Legends	23
8	Paralyzing Effects of Arms Agreements Based on MAD . . .	29
9	Analyses Based on Implausible and Self-Destructive Intercontinental Threats	32
10	Plausible Threats to West European Security	41
11	U.S. Strategic Nuclear Forces and Allied Security	44
12	Conclusion	54
13	List of References	56

SECTION 1

INTRODUCTION

Antagonists have usually found it handy to have both offenses and defenses--means of striking an adversary and ways of blunting a strike. Knights used swords as well as shields and suits of armor. Tanks have armor as well as armor-piercing guns. Fighter aircraft use shielded cockpits and self-sealing fuel tanks as well as guns or air-to-air missiles. And countries that at some uncertain future date just might consider starting a war to revise the status quo, generally have had some ways to destroy the adversary's means to conduct a war as well as some protection against those adversary means of attack that might survive their attack. Countries preparing to resist attack generally want the means to counterattack as well as to defend against an adversary's initial and continuing attacks; and want such protection to extend both to their military means for attacking and defending, and (however imperfectly) also to some important elements of their civil society and political order.

The exact mixture of offense and defense is likely to vary with the political and military objectives and circumstances of the two sides and with the changing state of the arts of offense and defense. Nonetheless, neither a pure offense nor a pure defense is an unmixed blessing. Boxers with a roundhouse punch and a glass jaw may never get to use their punch; and those that have prepared to absorb a great deal of punishment but not to dish it out, may end up by only absorbing punishment.

SECTION 2

WESTERN WAYS OF LOOKING AT OFFENSE, DEFENSE AND ARMS CONTROL

Disarmament negotiators for the democracies between the two world wars were interested in staving off the Second World War and, therefore, found it natural to seek agreements to limit offense weapons in particular and hopefully to eliminate them. Some weapons, such as short-range anti-aircraft guns, have as their only purpose stopping a weapon-carrier already on its way to target. A country that had only weapons effective against other weapons already launched against it, could hardly use such "purely defensive" weapons to start a war. And if no country had anything but such weapons, the reasoning went, no country could start a war.

The actual weapons available between the wars, however, did not fall so neatly into categories of pure defense and pure offense. The victims of an assault might use strike aircraft to launch a counter-assault. The aggressor might use defensive weapons to blunt the victim's counterattack. And some countries engaged in arms negotiations also contemplated using arms to extend their borders. Disarmament negotiators bogged down in a welter of ambiguities and confusion on the subject of such "qualitative disarmament." Winston Churchill, it was to be expected, made the essential point with devastating wit:

The Foreign Secretary told us that it was difficult to divide weapons into offensive and defensive categories. It certainly is, because almost every conceivable weapon may be used in defence or offence; either by an aggressor or by the innocent victim of his assault. To make it more difficult for the invader, heavy guns, tanks and poison gas are to be relegated to the evil category of offensive weapons. The invasion of France by Germany in 1914 reached its climax without the employment of any of these weapons. The heavy gun is to be described as "an offensive weapon." It is all right in a fortress; there it is virtuous and pacific in its character; but bring it out into the field--and, of course,

if it were needed, it would be brought out into the field--and it immediately becomes naughty, peccant, militaristic, and has to be placed under the ban of civilisation. Take the tank. The Germans, having invaded France, entrenched themselves; and in a couple of years they shot down 1,500,000 French and British soldiers who were trying to free the soil of France. The tank was invented to overcome the fire of the machine-guns with which the Germans were maintaining themselves in France, and it saved a lot of lives in clearing the soil of the invader. Now, apparently, the machine-gun, which was the German weapon for holding on to thirteen provinces of France, is to be the virtuous, defensive machine-gun and the tank, which was the means by which these Allied lives were saved, is to be placed under the censure and obloquy of all just and righteous men (Ref. 7)...

He added prophetically that the governments at Geneva would be better off trying to ban weapons that tended to kill and wound not only combatants, but also men, women and children far removed from areas of conflict.

Churchill challenged not only the clarity and usefulness of the distinction between offense and defense, but the political assumption implicit in the British negotiating stance--that the Third Reich (or indeed its immediate predecessor) threatened the French Third Republic no more than the reverse, and was no more likely to start a war to change the status quo. Hitler spoke, with greater eloquence than most remember, about the unfairness of the arms arrangements in the Versailles Treaty and about his own desire for peace as well as justice. As Alan Bullock's excellent book details (Ref. 14), Hitler struck a responsive chord among the British public and the British political elite, both left and right. But Churchill was much less susceptible even to plausible arguments for "equality" in arms that relied on the implied belief that reducing French superiority in military force would lessen the probability of war in the 1930s:

I should very much regret to see any approximation in military strength between Germany and France. Those who speak of that

as though it were right or even a question of fair dealing, altogether underrate the gravity of the European situation. I would say to those who would like to see Germany and France on an equal footing in armaments: "Do you wish for war?" For my part, I earnestly hope that no such approximation will take place during my lifetime or that of my children. To say that is not in the least to imply any want of regard or admiration for the great qualities of the German people, but I am sure that the thesis that they should be placed in an equal military position with France is one which, if it ever emerged in fact, would bring us within practical distance of almost measureless calamity (Ref. 8).

Democratic leaders and their publics, rather more than the dictators with whom they negotiate, tend to worry about fairness, about their own power exceeding that of potential adversaries, and about provoking adversary fears of being attacked. Since World War II, political elites among the democracies have often thought of reassuring potential adversaries, including the Soviets, by arguing that their military forces are purely defensive or by proposing programs for making them purely defensive and incapable of launching an attack. The Japanese, very early on, in Article IX of their Constitution, formally gave up the right to use any military force. As reality impinged, they modified the meaning of the doctrine. They came to interpret it as saying that they could have military force to repel attack on Japan, but not military force that they could use to attack others. They call their Defense Department "The Self-Defense Agency" to make explicit the purely defensive character of their Defense Department. For many years they severely limited the range of their fighters to make clear that they could not attack the Asian mainland, and they even constrained navigation and guidance to make sure they could not find targets even if they could reach them.

Japan adopted its constitution, with the help of that famous pacifist General MacArthur, at a time when its neighbors wanted a good deal of

reassuring that they would never have to worry again about an expanding Japan. Now, 45 years after Pearl Harbor, the dangers of Japanese aggression look pretty remote. The Soviets, above all, have little to worry about in that respect. But even our NATO allies, some of whom for over a century have been only the objects of aggression and have hardly even a farfetched motive or significant capacity for attacking the Soviet Union, feel it necessary to reassure the Soviets that they are not going to attack them.

The Norwegians avoid exercising their small military forces within 800 kilometers of their short Arctic border with the Soviets in order to persuade the Russians that they are unlikely to pounce on them, and they recently refused the United States permission to use F-111s in a joint exercise on the defense of Norway for fear of provoking the Soviets. NATO leaders, in general, are at pains to reassure Soviet leaders and their own publics that NATO is a purely defensive alliance. The Supreme Allied Commander of NATO, General Bernard Rogers, in November 1984, made clear that, even in the event of a massive Soviet invasion, NATO would use aircraft and missiles to attack Soviet "follow-on" second echelon forces but would not move large NATO forces across the border (as American and British forces moved into Germany near the end of World War II). He added that at most, if it were necessary to restore the "integrity of NATO territory," it was "conceivable" that NATO might, for that limited and temporary purpose, operate "a few kilometers" across the border. That was enough to cause a storm. The conservative West German Defense Minister, a notably sober and thoughtful man, immediately responded that "there are no [emphasis added] plans for NATO ground forces to advance onto Warsaw Pact

territory over the GDR border in the event of hostilities (Ref. 31);" the attacker would be deterred by the the risk that his country could be destroyed--that is, by strategic bombing.

More recently, ideas have been cropping up among various less sober factions in NATO countries for proposals that have as their main purpose to reduce the "NATO threat" to the Soviets. Some would, like the Japanese, try to get rid of aircraft capable of bombarding the other side. They would equip their F-16s with air-to-air but not air-to-surface missiles. Tanks would have to go, too, since they could be used offensively as well as defensively. Anders B userup, a Dane, would weaken further the already feeble Danish defense in this way, and the Danish Social Democrats in July 1986 formally adopted the idea. They propose to withdraw one of their three brigades in Germany to Denmark, restrict the Danish Navy to surveillance and mine sweeping, retain coastal missiles to defend against attacking ships, and call for reinforcements sent to Denmark by its NATO allies to operate only well inside Denmark and to abandon the forward defense strategy--again, so as not to frighten the panicky Russians (Ref 10). If a sober West German Defense Minister envisages stopping the German combined arms counterattack at the border, the Danish Social Democrats would not go even that far. They want to operate against invaders only well within their country.

In West Germany it is an official policy of the Social Democratic Party, adopted in May 1984, to dispense with tanks and fighter bombers and to reorganize the Bundeswehr to give it a "structural inability to attack (Ref. 23)." Pushed by men like Andreas von B low, a former junior defense minister in the Schmidt government, old ideas that flowered at the end of

the 1950s about defense by a people's militia flourish once more. They call for resisting Soviet attack, but in a way more like the guerrilla resistance offered by the Yugoslav partisans.

The British Labor Party now officially calls for a purely non-nuclear military force. They would abandon British strategic and tactical nuclear weapons and would call also for the removal of all American nuclear forces in England. It is now frequently remarked that such Europeans do not really think that there is much of a Soviet nuclear threat to Western Europe, but do think that there is an American threat—or at least a threat that is brought about because of the American presence there and especially the American nuclear presence.

SECTION 3

THE EXTREMES MEET: PURE DEFENSE AND PURE OFFENSE

Oddly enough (to complete this round-robin) the basic premise of the most vocal American critics of the President's SDI program--those who believe in a nuclear offense without defense--has to do with the importance they attach to assuring mutual destruction of the United States as well as the Soviet Union in the event of any use of nuclear weapons. This in turn is based on the belief, not unlike that of the advocates of non-nuclear defense without offense, that US nuclear forces threaten the Soviet Union and that we in the United States need to have the Soviets deter us. And that, they believe, entails assuring our own destruction if we attack the Soviet Union. A defense of the United States would get in the way. So, these American supporters of MAD and a pure offense bear an uncanny resemblance to the European supporters of a pure defense.

Explaining this strange convergence takes a little elaboration. When the enthusiasm for mutual destruction seized one faction of American scientists and engineers at the end of the 1950s, they centered their efforts first on banishing any attempt at the passive defense of populations, that is, civil defense. But the targets of their political offensive soon came to encompass any active defense that might shoot down enemy bombers or missiles on their way to the United States, any effort to direct our counterattack at missiles and aircraft on the ground or at other military targets rather than cities, and any improvements in the accuracy of our offense which made it capable of destroying military targets with reduced collateral harm to civilians. And in the mid-1960s the views of this faction among scientists and engineers in American

universities came to have a more than academic influence. Their views became the declaratory policy of the US government and, in fact, inspired the efforts of some of the principal negotiators on the American side at the first SALT talks and the attempts they made to relate offense and defense in the ABM Treaty and the SALT I agreement on offense forces. John Newhouse, in a now standard account of these negotiations, summed up concisely the model of stability of "Washington's assured destruction school of strategy." (He was a member of the school, but had a certain saving sense of its Orwellian absurdity.) He said its "favorite apothegm" was that "Offense is defense, defense is offense. Killing people is good, killing weapons is bad (Ref. 9)."

The American scientists and engineers who adopted this Orwellian view near the end of the 1950s were turning the tradition of arms control that had grown up between the Wars (and, indeed, the view they themselves had held for the preceding decade) precisely on its head. While the 1930's views had all the disabilities that Churchill listed, and more, they are no better upside down. They are much worse. This upside down view of offense and defense and the virtues of bombing civilians and avoiding military targets raises insoluble military and strategic problems for the Alliance. The use of such apocalyptic rhetoric ties democratic governments in a hopeless tangle of moral issues. It does not pacify the pacifist extremes of domestic opinion. It incites them. It makes for endless confusion about the difference between the declaratory and the operational policy of Allied governments, between what they say they will do and what they would actually do in the event of any of several plausible Soviet attacks. Avoiding a capacity for anything but purely

suicidal offense in response to attack leads naturally to the idea (or wish) for "deterrence only" or "pure deterrence" (what the French call "dissuasion pure")--the hope that we can threaten the purely suicidal use of nuclear weapons in response to a Soviet nuclear attack and at the same time explicitly insist that nuclear weapons have no use at all except to deter. Which is to say out loud that whatever our leaders threaten, they should not actually respond to attack. Which means, of course, that they can hardly deter.

SECTION 4

THE INCOMPATIBILITY OF MAD WITH US GUARANTEES TO ALLIES

Robert McNamara, the former American Secretary of Defense, has been most forceful in recent years in drawing out some of the consequences of the upside down view of offense and defense involved in the theory of Mutual Assured Destruction. He was the key figure in progressively altering and perhaps the major figure in propagating a quite fateful change in the original second-strike theory of deterrence. The second-strike theory originated in the early 1950s in the context of the use of long or intermediate range nuclear forces to deter or defeat a Soviet invasion of Western Europe (Ref. 32). It stressed that in order to deter a Soviet attack on our allies, we would need to preserve a capability to respond even if the Soviet attack were enlarged to include also an attempt to destroy US nuclear forces we needed to respond to the invasion: a strategic force could not deter an attack that it could not survive. It had to be able to strike second. But the theory stressed not only the ability to respond, but the likelihood of the response. To deter Soviet political leaders from using nuclear weapons in the most plausible and dangerous circumstances that might prompt their use, we had to give them reason to expect us to respond and to do it in ways that would, in prospect, make the Soviet use of nuclear weapons riskier than the alternatives, even when these alternatives--like unexpected disaster in a conventional invasion--might seem dangerous. It stressed, therefore, the importance of preparing a posture that at the time of decision would make our decision to respond to attack one that would serve our interests, and, in particular, make it less risky for us than not responding.

McNamara, in the Mutual Assured Destruction theory of deterrence, adopted that part of the second-strike theory which dealt with the necessity for a capability that would survive Soviet attack, but ignored the part of the theory that stressed the necessity for having a force that responsible political and military leaders would actually be willing to use in answering attack. MAD held that what matters for deterrence is our having the capacity to inflict "unacceptable damage" even if it would be suicidal for us to use that capacity to respond. McNamara centered his attention on the amount of damage we could do and not at all on the likelihood that we would actually bring on that damage. The risk to the Soviets is the product of two factors: the amount of harm we are capable of doing, and the probability that we would use that capability to do harm. McNamara ignored the probability component of the product. He defined "deterrence" as the capability in any circumstance to inflict "unacceptable damage" and measured that in terms of the ability to kill 20% of the people and destroy half the manufacturing value added (Ref. 12) --which would mean its end "as a functioning society."

The theory raises many questions, but it is most transparently incoherent, and fatally so, in taking mutual deterrence as an American goal. That entailed directly that we wanted the Soviets to be able to destroy us as a functioning society even if we struck first. But that implied in turn that if we responded to a nuclear attack we would be committing suicide. (If we could not survive as a functioning society after using an undamaged force, we surely could not survive if we struck second with a force that had been partially destroyed.) That in turn tends to erode the credibility of our response and so to undermine our ability to deter any

Soviet attack confined to an ally; or any attack at all confined enough to leave us the prospect of survival if we did not respond.

SECTION 5

THE INADEQUACY OF BIPOLAR MODELS OF STABILITY

The mathematical models of strategic stability that abound in the literature today proceed from Mutual Assured Destruction theory. They focus on the binary relation between the United States and the Soviet Union. They have many artificialities and implicit absurdities.* Some West Europeans have been impressed by the way these models are supposed to show that active defense or precise offense is "destabilizing." The key defect they should notice is that such models make impossible any coherent justification for our alliance relationships, or any stable multilateral world that includes some non-nuclear as well as nuclear countries. That is to say, the real world. A perfectly stable unconditional mutual deterrence between the United States and the Soviet Union would mean that the US could not respond to, and therefore could not deter, a Soviet nuclear attack on any allied country including the 13 countries in NATO that have no nuclear weapons of their own. Nor could Britain or France. The relevant conception of stability, then, cannot be captured in the binary relationship between the US and the Soviet Union. Nor even by a set of pair-wise stable deterrent relations among the five nuclear powers. The many-country relation among nuclear and non-nuclear powers is not as simple as that. It is rather more like the "many body" problem in physics.

Much of arms control theory during the past twenty years has come to be based explicitly or implicitly on the doctrine of Mutual Assured Destruction. The interpretation of the ABM Treaty that would prevent the

*For one thing, they are quite unrelated to Soviet thinking.

United States from developing and doing enough testing of ballistic missile defense sub-systems and battle management to form the basis for a decision on whether or not to deploy such a defense is most prominently supported by those who define "strategic stability" in terms of a hypothetical suicide pact between the United States and the Soviet Union. They assign to the distinction between "first strike weapons" and "second strike weapons" a role quite analogous to the role given by the arms negotiators of the 1930s to the distinction between "offense" and "defense." But this leads to a morass of confusion even more formidable than that faced by the negotiators of the 1930s. Weapons fall even less neatly into "first strike" and "second strike" categories than into "offense" and "defense."

Terms like "second strike" and "first strike" apply to military forces as whole connected systems (including vehicles, sensors, communications and political military commands) in their interaction with adversary military forces as a whole. They designate system properties, not attributes of individual weapons.

More obviously, many European and American negotiators in the 1970s and 1980s seem to have forgotten that for excellent reasons the United States promises to respond to a Soviet nuclear attack even if it is solely directed at an ally and promises to do so, therefore, with a force that has not itself been attacked. Viewed exclusively in the narrow context of the binary relation between the US and the Soviet Union, that would be a "first strike." However it would not start a war, only join one that had been started by the Soviets. And in the wider context of the original second-strike theory, the prospect that the US would respond to a Soviet

nuclear attack on West Germany or Turkey or Norway, or the like, with such a "first strike" is a necessary condition for stability in the real world of many states, some nuclear and some non-nuclear.

The foregoing suggests what the proponents of pure offense for mutual assured destruction have in common with the proponents of pure defense. Like the latter, they implicitly base their view on the theory that the West, or at least the United States, threatens the Soviet Union in the sense that it is quite likely to initiate an unprovoked attack on the Soviet Union, unless it is assured of total nuclear destruction should it do so. However, this defies common sense. The United States could have launched a nuclear attack on the Soviet Union for many years without suffering nuclear destruction. It could have done so during the long period when the Soviets had no nuclear weapons at all, and even during the more extended period when their nuclear forces were small and vulnerable to attack. (The small Soviet bomber force was unprotected and in a low state of readiness. Its few land-based Intercontinental Ballistic Missiles were unprotected by silos before 1965. Its missile launching submarines were mainly in port and, when out of port, noisy and easily tracked, as has recently been revealed in connection with the Walker spy ring.) In spite of dark hints by the conspiratorial left in the West, preventive war has never been seriously considered by responsible American leaders. They never considered it in a period of great Soviet vulnerability when the Soviets were actively expanding their political control in Eurasia and imposing their will over dissident, newly acquired parts of their empire in Central Europe which had been associated with the West for centuries. Moreover, the Soviet leaders could hardly have been panicked

by the prospect or they would not have left themselves so open to attack while they were making these aggressive moves. The idea that NATO or the American nuclear force was poised to pounce on the Soviet Union was clearly absurd for the 20 years when the Soviets either had no nuclear force or only a quite vulnerable one.

It is even more absurd today with the enormous protected power that the Soviets have acquired to do the United States harm. The notion that NATO or any of the major powers in NATO would be likely to initiate a preventive nuclear war against the Warsaw Pact or the Soviet Union, if only it could be done without committing total suicide, is a fantasy treated solemnly in mathematical models of strategic stability and in the rhetoric of Western politicians under the unconscious influence of such models. It should not be taken seriously. NATO will have difficulty enough making the decision to respond to a selective nuclear attack or overwhelming conventional assault, not to speak of initiating an attack that did not answer an actual invasion.

No responsible political leader in NATO will make a decision to counterattack if he believes that would assure the complete destruction of his nation. Responsible NATO leaders who fear attack, then, should put themselves in a position to respond in ways that give their adversary some stake in keeping destruction under control.

We should be clear. The issue is not, as supporters of MAD pretend, between those on the one hand who predict that a large-scale exchange of nuclear weapons could take place with perfect discrimination (a war "without a smudge" as Stanley Hoffmann calls it (Ref. 16)) and, on the other hand, those who claim that any significant use of nuclear weapons will

lead to exhausting the stockpiles of all the powers and the end of civilization on both sides--and possibly even the human species. No substantial conflict, nuclear or non-nuclear, is likely to be neat and perfectly controlled. Even if we could completely confine the destruction--which we cannot--to military targets, the slaughter of soldiers would be disaster enough. There will always be a substantial chance that violence would climb disastrously beyond any expected bounds. The genuine issue lies between those who would try to improve our ability to be effective against military targets, to confine the destruction as much as possible to military targets rather than to civil society, and to keep destruction under gross control, on the one hand, and on the other, those who, while they profess merely to be predicting the loss of control, actually attempt to arrange it. Both sorts of strategy take deterrence as primary. One holds that the West can deter Soviet attack most effectively by improving our ability and our will actually to respond in a non-suicidal way if deterrence fails. The other view rests its hope for deterring on assuring that, if deterrence fails, any response we could make to an attack would lead uncontrollably to the apocalypse.

Even the staunchest supporters of MAD doctrine, those who believe that any militarily significant use of nuclear weapons will inevitably lead to the destruction of civil society in both the East and West quail at saying clearly that they would actually launch attacks at innocent bystanders, if deterrence fails. They either imply that they would not respond at all, or--inconsistently recognizing that it is possible to exercise control and selectivity--they say that of course, if deterrence fails, one must do everything possible to avoid killing innocent

bystanders on both sides (Ref. 17). However, such an obligation does not begin when deterrence fails, and not only for moral reasons: in order to make the prospect of our responding credible and deterrence therefore feasible, we need in time of peace to improve the means of controlling destruction and preserving civil society.

SECTION 6

THE IMPROVED PROSPECTS FOR DEFENSE, FOR DISCRIMINATING OFFENSE, AND FOR KEEPING DESTRUCTION UNDER CONTROL

The continuing industrial revolution in microelectronics and photonics is greatly increasing the feasibility of control. It is drastically altering the technologies of offense and defense for both the Soviets and the West. Large improvements in sensing, data processing and control make more feasible than ever before the precise use of small nuclear weapons designed to confine effects mainly to the military targets they destroy, and of non-nuclear weapons, to accomplish many missions previously achievable only with nuclear weapons or with huge, indiscriminate non-nuclear raids like the ones that destroyed Hamburg, Dresden and Tokyo. Moreover, essentially the same information technologies will make available an active defense that uses precise non-nuclear means to intercept substantial numbers of enemy nuclear warheads on their way to military targets located near cities--and this can form an important part of the defense of key military forces. It can offer also a measure of protection of population from collateral damage from plausible Soviet attacks. The instruments for keeping destruction under control are also becoming both more effective and easier to protect because small packages of less expensive but reliable sensors and increasingly powerful data processors and communications can be easily multiplied and moved or otherwise made less vulnerable to attack. What is more, there is a useful interaction among capabilities for active defense, discriminating offense and the capacity to keep them under control and direct them. (And on the other hand, reckless proposals that we should, instead of defending our ICBMs, launch them at Soviet cities on the basis of electromagnetic indications that an

enemy attack may be on the way illustrate the unfortunate way in which a doctrinaire attempt to avoid defense can worsen both the prospects for discrimination in offense and any attempt to maintain control. See Fred Hoffman's letter commenting on Richard Garwin's proposal to make the launching of ICBMs largely automatic, in our last Progress Report to DNA.)

The NATO countries; in accordance with their long tradition of innovation in science and technology and the agility native to an open society, can exploit the opportunities that these developments present. The Soviet Union with a culture much less congenial to innovation, is, in any case, doing everything it can to exploit them--and not in the interest of the West. These technological developments will reinforce the Soviet capacity for active defense of its military forces but also its ability to conduct a strategy of selective attack, for example, against the Federal Republic of Germany and the Low Countries, or against a weakly armed, but critical flank of NATO, or in an area like the Persian Gulf on which the countries of NATO have come critically to depend. Such a selective strategy of attack, designed to split the Western Alliance, could greatly reduce the damage to the civil society of the country invaded and leave the civil society of the other countries in NATO essentially untouched. It would leave Western leaders with a maximum stake in exercising prudence. It is the most controllable and least risky strategy for the Soviets--especially if NATO has no appropriate response. Yet, the threat of such a Soviet attack or its actual execution could endanger the autonomy of all those members of the NATO alliance who are not directly attacked.

NATO has been preoccupied with extreme contingencies and Soviet

attacks so enormous and so unselectively destructive that the suicide of the West in response would be redundant. Such extreme circumstances would make a policy of responding in a "dying sting" at least faintly plausible. (Responding would do us no good but neither would it do us extra harm.) Its strategy has drifted increasingly towards dependence on an apocalyptic threat to initiate an indiscriminate attack which it does not expect to be able to control. Worse, much of Alliance policy on research, development and deployment has deliberately avoided making NATO capable of exercising discrimination and control. And NATO's strategy for negotiating and construing bilateral agreements with the Soviets is based on the same premise. While it has been designed in the hope that any use of nuclear weapons would result in the total destruction of the Soviets as well as the West, it has succeeded only in hampering improvements in NATO's own ability to control destruction.

SECTION 7

THE PARALYZING EFFECTS OF ARMS RACE LEGENDS

In spite of all the stereotypes about a spiralling quantitative arms race generated by an ever accelerating qualitative race, which in turn is driven by American technology, the fact is that if we consider deployment as distinct from research and development, American military innovation has slowed down. It has been clear for many years that continuing references to a quantitative strategic arms race, standard throughout the sixties and seventies, ignored the realities (Ref. 33). Supporters of MAD kept talking about the quantitative spiral while the budget for the strategic forces decreased exponentially at 8% a year. It is not as widely understood that the statements about an ever accelerating qualitative race are also fantasies that sell well in Congress and in the press, but have nothing to do with what has actually been happening.

The recent Presidential Blue Ribbon Commission on Defense Management (the Packard Commission (Ref. 22)) found that in the last 25 years the length of time to deploy a major weapon system has increased. Polaris, our first submarine-launched ballistic missile, took two or three years to become operational. Our first Minuteman took about the same. The time to deploy has stretched to 10-15 years for major weapons systems. What the Packard Commission does not stress, is that the deployment of some key innovations that cut across weapons systems and service lines and, in particular, some of those affecting precision, active defense, communications and control, have stretched out even longer--in some cases interminably.

The Defense Department was once far in advance of the commercial

world in data processing and in communications, in getting innovations into the field, as well as in research. Today many important inventions are fielded in commercial products long before they are deployed by the military. This of course has much to do with the inertia of large military organizations, service parochialism and the increasingly cumbersome process of getting Congress to authorize and to appropriate funds. However, the inertia and parochialism are not new. One basic reason for the stretch-out is the lack of a clear national commitment to field these technologies and an increased confusion in objectives. And this time lag associated with the lack of clear objectives has much to do with the spread of the ideology of mutual assured destruction with its accompanying hostility towards improving precision and discrimination of offense, towards fielding active defenses even of military systems for fear that such systems might be extended to protect population; and towards improvements in our capacity to maintain control throughout a conflict for fear that this might be "provocative." Theorists of a qualitative race have for a long time called for renewed efforts to "slow down the rate of weapons innovation" and "hence to reduce the frequency of introduction of ever more complex and threatening weapons (Ref. 35)" and have advocated "the adoption of a generalized set of restraints that would slow the whole development and deployment process (Ref. 11)." They have tried to accomplish this especially in limiting tests (Ref. 3). One way or another they seem to have been successful.

A few illustrations, some familiar and some less familiar:

(1) The Carter Administration cancelled the program to deploy neutron weapons in Europe, even though European NATO had agreed reluctantly to

accept them and despite the fact that they would reduce the blast effects and hence the collateral damage done by NATO to its own civil society in stopping a massive Soviet armored invasion.

(2) High level figures on both sides of the Atlantic agreed to cancellation in 1979 of earth penetrating warheads for the Pershing II even though such warheads had gone through full-scale engineering and development and would have made it more feasible to destroy hard and semi-hard fixed military targets with effects substantially confined to these military targets.

(3) AIRS, the advanced inertial guidance system used in the ICBMs the United States is presently planning to deploy, was delayed in its development by the opposition of supporters of Mutual Assured Destruction (MAD) policy in the American Senate even though, and indeed because, it greatly improved the precision of inertial systems and so made them capable of destroying military targets with smaller collateral effects. The opposition didn't stop the development. It did slow the all-inertial guidance.

(4) More important, these supporters of MAD succeeded in actually stopping a half dozen programs for research and development on mid-course and terminally guided ballistic missiles even though such guidance can make feasible the destruction of very hard military targets with warheads of very low yields and confined collateral effects, and even though such ICBMs could be much smaller, cheaper and more easily moved and otherwise protected than any now programmed (such as the Midgetman) using only inertial guidance.

(5) The Mutual Assured Destruction dogma reinforced the inertia characteristic of large organizations by slowing the development of long-

range cruise missiles with accuracies excellent enough even in adverse weather to permit the use of non-nuclear warheads to destroy a variety of quite hard military targets. One might think that replacing nuclear with non-nuclear warheads would appeal even to proponents of MAD. However, any missile with guidance good enough to destroy a distant military target with a non-nuclear warhead, weighing, say, 1000 pounds, could destroy an even more distant military target with an even higher probability if it carried a light-weight nuclear warhead weighing a fifth as much or less. Proponents of MAD have opposed these dual capable missiles because of their dual capability.

(6) Supporters of MAD have opposed any major effort by the United States to improve the protection of its wartime command and control on the ground that this would be a "provocation" to the Soviet Union (Ref. 34). Meanwhile, the Soviets have spent many tens of billions of dollars over many years to elaborate a formidably effective, mutually reinforcing network of measures for protecting political and military command and control that include deception, concealment, mobility in the air, on the ground and below ground, dispersal, deep underground structures and active defense. They have designed their system to survive a nuclear war, not just in peacetime. Yet no one has said that their program is provocative.

(7) One important example of the delay in fielding a revolutionary advance has to do with a drastic change in the architecture of telecommunications networks: packet switching was invented in 1961 by Paul Baran as a major contribution to the solution of the command and control problem (Ref. 1). He proposed a method of high speed adaptive digital switching for voice and data communication which made it possible to use

the surviving links of the extremely vulnerable hierarchical land lines with their few critical nodes in a distributed net with thousands of nodes, none more critical than any other, and to use surviving links in satellites, radio and other media as well. Packet switches made it possible for messages to bypass any parts of the network that were destroyed and find their way automatically to their destination. As Lawrence Roberts wrote in his account of "The Evolution of Packet Switching:"

This study [Baran's] was conducted for the Air Force and it proposed a fully distributed packet switching system to provide for all military communications, data and voice. The Study also included a totally digital microwave system and integrated encryption capability. The Air Force's primary goal was to produce a totally survivable system that contained no critical central components. Not only was this goal achieved by Rand's proposed packet switching system, but even the economics projected were superior, for both voice and data transmissions. Unfortunately, the Air Force took no follow-up action, and the report sat largely ignored for many years until packet switching was rediscovered and applied by others (Ref. 24).

An application of packet switching was later developed by the Defense Advanced Research Projects Agency (DARPA), not for the command and control problem, but as a generally applicable method for widely separated computer users to share data bases. It became the dominant commercial technology for data transmission for private networks long before it received any application to the problem which generated it. It is only now--over 25 years later--that it is being deployed for GWEN, the Ground Wave Emergency Net for low data rate transmissions in the military; and it is planned to form the basis of the Defense Data Network in the 1990s. Its application to voice transmission in the form of new fast packet switches started being used commercially in 1986 and it will be key in the basic architecture for the AT&T system in the 1990s. But it is not so far

planned for any substantial use in voice transmission for military communications--even though the military application is in key respects easier.

These long delays have something to do with bureaucratic inertia and the particular difficulties incurred because command and control programs tend to be joint rather than for an individual service. However, the inertia is reinforced by the neglect of command and control by the highest levels of government and that in turn is encouraged by doctrines that threaten mutual destruction and count on losing control, if not at the start of a nuclear war, then soon after.

SECTION 8

PARALYZING EFFECTS OF ARMS AGREEMENTS BASED ON MAD

Arms agreements have had similar effects. The SALT I offense agreement and ABM Treaty--which are most frequently referred to as the "jewels in the crown" of arms control by heads of state and the mass media--were supposed to relate limitations in US defense to restraints on Soviet offense. They were also based on the perverse dogma that the superpowers should have weapons capable only of destroying population, and none that could destroy the other side's weapons on the ground or on their way to target. The ABM Treaty severely restricted not only the defense of cities but even--contrary to the dogma--the defense of the offense ICBM silos and national command and control. Moreover, some key American negotiators wanted the SALT I ABM Treaty to proscribe even the future development and testing (not only the deployment) of improved small, mobile sensors and mobile interceptors and any new means which would have offered an increasingly effective protection of ICBM silos, command centers and other key military forces. While the dogma summarized by John Newhouse would seem to make protecting weapons good and only protecting people bad, these negotiators were concerned that, even if a silo defense could not protect people, it might become part of a thick defense of the entire population of the country at some future date--a vast additional enterprise taking many years which one might think could be dealt with separately if it were plainly wicked. The SALT I Offense Agreement professed to replace active defense of US ICBM silos by committing the Soviets not to deploy any additional missiles with warheads capable of destroying US ICBM silos. This was supposed to be accomplished by prohibiting any increase in the

number of silos for "heavy missiles." But the Soviets squeezed many more warheads than US negotiators thought possible--though they had been plainly warned--into both "heavy" and "light" missiles and drastically improved the precision of their warheads. As a result they ended up with nearly three and possibly six times the number of warheads capable of destroying ICBM silos than these US negotiators had expected!

The ABM Treaty was explicitly directed at constraining defenses against "strategic" ballistic missiles. It was never intended to prevent a defense accurate enough to make the payload lethal*--and with its few-hundred mile range, the SS-NX-13 could be launched from well outside the surveillance coverage of a carrier task force. The U.S. Navy proposed a defense against this development, whose major components were the Aegis radar and a nuclear version of its air defense "Standard Missile," the SM-2. While the treaty clearly did not envisage stopping defense against a ballistic missile threat to the fleet at sea, some in the Department of Defense bureaucracy argued that such a defense could always be moved into U.S. ports or deployed on land and so would become a defense against strategic ICBMs, or that the development of a defense against a ballistic missile threat to ships at sea could be expanded to become a defense against ICBMs. The development therefore was stopped.

Some of the current arguments against developing a defense against the ballistic missile threat to Europe are essentially the same as those against the SM-2 and Aegis. They display a serious difficulty characteristic of the kind of arms control arrangements which have dominated the debate in the West for the last two decades. Every military system can be

*J.C. Nolen, et al, U.S. Antitactical Ballistic Missile Defenses, Institute for Defense Analysis, Paper P-1175, January 1976, pp. 29-34.

used more or less effectively to achieve more than one objective. And any military objective can be achieved in more than one way. Proponents of agreements based on mutual assured destruction tend to argue against any system even if it is clearly dedicated to a permitted purpose on the ground that it could, even if with great difficulty and over many years, be diverted or used for some forbidden purpose. On the other hand, when the Soviets actually develop or deploy a system which clearly is dedicated to a forbidden purpose, they tend to argue that the Soviets could have in mind a more benign permitted purpose. A radar then which is obviously designed to aid in battle management for the defense against ICBMs can always be explained away as serving the function of tracking space vehicles, even if it is poorly placed for that purpose.

Bureaucracies develop a vested interest in the continuation of any status quo, and in the West this includes conforming to the status quo of an arms agreement, even if an adversary does not. Supporters of MAD sometimes explicitly assume that it is a good thing for "Arms Control" when such bureaucratic inertia leads Western governments to lose sight of their original goal in the agreement of securing Soviet restraint and leads them to continue to comply with the agreement while the Soviets make massive preparations to violate it and do so (Ref. 5). That happened during the moratorium on nuclear testing from 1958 to 1961 which ended with a surprise Soviet 60-megaton bang and an unprecedentedly elaborate and carefully prepared sequence of Soviet tests. The Soviet bureaucracy, which is not always inert, had responded efficiently to the political leadership. And the Soviet leaders had political and military goals that were quite incompatible with those the British and Americans had in mind.

SECTION 9

ANALYSES BASED ON IMPLAUSIBLE AND SELF-DESTRUCTIVE INTERCONTINENTAL THREATS

In deciding on whether or not to develop or deploy new technologies for offense and defense--and not only in preparing arms agreements--Western leaders and Western publics ought to consider more soberly than they do Soviet political and military objectives and their likely course of behavior in a variety of realistic contingencies. Our decision on developing and deploying such new technologies should consider how an innovation will protect our interests in such contingencies. The debate frequently appears to be about details of the technical feasibility and performance of some proposed new system. But a close examination reveals that the technical arguments in opposition are often crucially affected by preposterous assumptions about the circumstances of Soviet attack in which we might need the proposed new military system and in particular about the objectives of the Soviet attack and of our own responses.

For example, the debate about the proposed Safeguard ballistic missile defense of Minuteman silos appeared to the Congress and the news media to be about innumerable calculations on the performance of radars and high acceleration interceptor missiles and about whether Soviet missiles in prospect for the end of the 1970s and 1980s would have accurate enough MIRVs to endanger the Minuteman silos even if there were no silo defense. The Congress and the public do not in general feel qualified to evaluate such calculations. They tend to accept the authority of one faction or another of the technologists, for the calculations are of the sort normally performed by professional operations research men, system analysts, and system engineers.

In fact, the arguments against introducing an active defense for silos had numerous technical flaws. Those who said that Minuteman silos would need no defense made mistakes in algebra, in arithmetic, in reading points off graphs (Ref. 13). But the serious defects in the debate were more fundamental. The genuine issues were different. Some proponents of Safeguard believed--correctly as it turned out--that Minuteman was likely to become vulnerable by the end of the 1970s, that an active defense would be a useful supplement to the passive defense of ICBMs and that an active ballistic missile defense, even if it started off imperfectly, could be improved as the technology developed, permitting the use of smaller, more mobile radars and sensing and guidance that would make possible the use of non-nuclear interceptors. Above all, they felt, this was an important line of development and for the long-run future a useful contribution to the mixture. (Polaris was deployed at the end of the 1950s long before it was perfected, and was continually improved. It is doubtful that any complex new system would ever be deployed if we insisted on meeting all possible counter-measures of the kind that can be conjured up by those who oppose it in principle. In fact, part of the reason for the slow-down in US deployment of major weapons systems has been the unrealistic demands for performance imposed by those who take a Luddite view of military innovation in general.)

Opponents of Safeguard were against it primarily because they thought an active ballistic missile defense of silos might in the future be made part of a much larger, thick system to defend populations and they were in principle against the defense of population because they subscribed to the doctrine of Mutual Assured Destruction. Some key opponents, as we have

said, suggested that rather than defend our ICBMs, we should launch them automatically at Soviet cities on the basis of electromagnetic indications that an attack might be on its way.* And though they talked much about the initial limitations of an ABM defense based on a few fixed large radars, they attempted in the ABM Treaty to prevent research and development that would lead to small, mobile radars of the kind they had said were necessary. The discussion of the treaty and the unilateral decision on defense paid inadequate attention to Soviet political military objectives in seeking a treaty or the realistic circumstances in which the Soviets might be tempted to launch a nuclear attack.

The contemporary debate on ballistic missile defense centered on the Strategic Defense Initiative is as badly informed as the debate in 1969 on Safeguard. Once again, it seems to be about the intricate details of technological and systems analytic issues--the number of space-based chemical laser platforms needed to destroy Soviet ICBMs in their boost phase and the like. And again, the media headlines offer sweeping judgments by apparently authoritative experts who claim they have shown that any useful ballistic missile defense is essentially infeasible--astronomically costly to us and easily overcome by the Soviets. There are, indeed, large technological uncertainties that need to be resolved before deciding on deploying or not deploying an active ballistic missile defense as part of the US and Alliance mixture of forces. These, however, are unlikely to be resolved except as the result of an extensive research, development

*Fred Hoffman, Pan Heuristics, has some work in progress on this point.

and testing program. In fact, to inform that decision is precisely the purpose of such a program.

The arguments that have been raised against a program of research, development, testing and evaluation hardly address the real issues. They pretend more knowledge than anyone has at this stage about the technological alternatives. They avoid, in particular, any serious consideration of the variety of circumstances in which the Soviets might use ballistic missiles against the Western Alliance, the kinds of attack they are likely to make, the political and military objectives that are likely to govern such an attack and the objectives appropriate for the US and its allies in defending against such an ICBM attack. The systems' analytic arguments embodied in early reports on the subject have gained an authority they do not deserve from the famous names mustered to sign the reports and the sheer mass of the number of signatures.

Take the question about the number of space-based laser platforms needed by the defense in the boost phase and their cost implications. The Union of Concerned Scientists (UCS) in March 1984 issued a report signed by Hans Bethe, Richard Garwin, Kurt Gottfried, Henry Kendall, Carl Sagan and many others well-known in theoretical physics, in the study of planetary atmospheres and of many subjects only distantly related to the issue. They include some signers who at various times have worked on some of the technologies associated with national defense. The UCS report said that "we need 2,400 such laser weapons in orbit altogether (Ref. 29)" and that the cost would be prohibitive, therefore, compared to the cost of offsetting countermeasures in the boost phase. However, by the time the report was ready for distribution, the press release suggested a little

caution. It claimed only that "over 1,000 such satellites" would be essential (Ref. 28). But that, it developed, was not nearly cautious enough. In the controversy which ensued, Gregory Canavan and his colleagues at Los Alamos were able to demonstrate some obvious blunders in the calculations (Ref. 4). By October 1984, Bethe, Garwin, Gottfried and Kendall, key UCS signers of the report, had reduced the original number by a factor of eight to 300 (Ref. 27). And the Union of Concerned Scientists had also put out a new report, The Fallacy of Star Wars, with the number 300. Later revisions in correspondence with Canavan brought the number down to on the order of 100.

All models simplify, but the models used by the UCS not only make excessively simplifying assumptions about the missile launch configuration, the laser to booster assignment and the motion of the lasers and platforms during the battle. They also ignore the adverse effects on the Soviet offense which are brought about by some of the tactics they would propose to defeat the defense in the boost phase. These tactics would expose Soviet ICBMs to greater troubles in later phases of flight. (For example, launching all boosters simultaneously spreads out the RVs on their arrival in the terminal phase and so makes them more vulnerable to terminal defenses). They ignore the fact that satellites in orbit not in position to attack ICBMs in the boost phase may be able to intercept SLBMs in mid-course. That alters the relevant ratios of cost of defense to cost of offense.

The UCS models also assume strategies for the basing of the Soviet ICBMs which concentrate them all at a point, making obsolete a huge Soviet investment in existing silos which are now strung out along a 5,000 mile

arc following the Transiberian Railroad in Asia as well as along the main transportation net in European Russia. Aside from that, such concentration of all the Soviet ICBMs at a point would expose them to our offense in ways that the Soviets would not welcome if they contemplated making a ballistic missile attack during the course of a conventional invasion in the Eurasian periphery. (An important example of a useful synergy between offense and defense.) Brian Chow and Jon Arenberg of Pan Heuristics have developed a linear programming model which uses more realistic satellite constellations and can handle any distribution of Soviet ballistic missile launch points including the plausible launch points for SLBMs. Their preliminary results suggest that the UCS number of 300 satellites appears to confirm that number as too high by a factor of 3 to 5 (Ref. 6).

Perhaps the most fundamental defect of such calculations resides in the implicit assumptions about the nature of the Soviet attack and the political military objectives the Soviets might have in mind. In brief, they assume that the Soviets would open a war with an attack directed at destroying innocent bystanders rather than to obtain some concrete political military purpose such as to remove obstacles to their invasion of West Europe. If killing harmless civilians is all they have in mind in a surprise attack, they might be satisfied then if only a small percentage of their weapons were to get through. These would kill a great many American bystanders. But such a military objective would be absurd. It is very different from the sorts of military objectives that might interest the Politburo.

The March 1984 UCS report carries absurdities about Soviet attack to the farthest point in suggesting that the Soviets might carry out such an

attack even if they knew it could cause a nuclear winter. A year or two earlier some meteorologists and other natural scientists had come up with a new physical phenomenon. They claimed that any Soviet attack substantial enough to have a significant military effect would send so much smoke from burning cities into the troposphere and loft even higher into the stratosphere so much fine submicron dust from nuclear weapons exploding near the surface of underground targets that the heat and light from the sun would be blocked and temperatures would fall disastrously throughout the Northern hemisphere (Ref. 25). The direct rebound from the Soviet's own weapons would then endanger life in the Soviet Union even if NATO did not respond. In that case, NATO leaders would not have to face the terrible decision. No need for NATO to "sting." The Soviets would have stung themselves. If the scale of a Soviet first strike had to be large enough to cross the "threshold" of nuclear winter, they could in the words of Dr. Stephen Schneider of the National Center for Atmospheric Research "win for two weeks only, until the cloud of nuclear smoke or dust comes back over (Ref. 26)."

But the newly discovered uncertain potential that huge nuclear attacks directed at cities may have for causing a nuclear winter does not fill the void in MAD doctrine. Instead, it makes more clearly visible the preposterous assumptions about Soviet attacks and Western responses that are at the heart of the doctrine of Mutual Assured Destruction. A close examination of the "scenarios" that form the basis for nuclear winter calculations demonstrate this quite apart from all the uncertainties about the physical phenomena connected with nuclear winter such as the density of fuel in various locations, how much of it would burn and send particles

of smoke and dust into the atmosphere, how the clouds of dust and smoke would be transported vertically and horizontally, etc., etc. Such scenarios invariably resolve uncertainties as to how the Soviets might use nuclear weapons and how we would and should respond by assuming that such decisions would be made without any regard for avoiding self-destruction. In fact, in these scenarios the two sides appear to take part in an intricate collaboration to assure that their nuclear weapons will have little relevant military effect, but do enormous collateral damage to civil society both locally and globally. In the international study of nuclear winter and other environmental consequences of nuclear war sponsored by the Royal Swedish Academy, the two superpowers are presumed to explode 15 nuclear weapons with a total yield of 10 megatons over each one of such cities as Hong Kong, Bombay, Calcutta, New Delhi, Madras, Dacca, Jakarta, Manila and Sydney. That would generate a great deal of smoke, but it is not clear what it is supposed to do to further the objectives of either side in a military campaign.

It is true that political and military leaders and most large bureaucratic organizations often act mindlessly. But theorists of bureaucracy tend not merely to describe the inertia of bureaucracy. Many prescribe it. There is a naive cynicism in supposing that we can do nothing to avoid self-destructive courses of action. And it is worse than naive to suppose that the Soviets, if they attacked, would never use nuclear weapons except in a way that would lead to their own destruction. As for the West, such an image of the consequences of any nuclear response to a Soviet nuclear attack leads more naturally to capitulation than to rash acts. Indeed bureaucracies, though frequently irrational, are not always

--or often--irrationally daring.

In any case, such lurid views of a nuclear exchange shape the course of much policy discussion in ways that are not widely understood. And the Soviets make their own contribution to Western debate by encouraging the notion that if they attack, they would destroy Western society even if in the process they destroyed themselves. This has been plentifully illustrated in the discussion of the Strategic Defense Initiative. Hans Bethe, Richard Garwin, Carl Sagan and other members of the Union of Concerned Scientists in their report of 1984 prophesied that if the United States were to attempt any "serious" protection of its cities, a "likely response" by the Soviet Union would be "to target its missiles so as to maximize damage to the US population" even though that would "pose serious danger of triggering a climatic catastrophe (the nuclear winter phenomenon) (Ref. 2)."

This preoccupation with the most catastrophic sort of attack is very widespread in the West. Some of the technologists who advocate President Reagan's Strategic Defense Initiative have focused on attacks no less preposterous than those posited by the opponents. They have considered Soviet attacks involving as many as 30,000 strategic ballistic missile warheads (many times the present total), all directed at cities in an all-out opening "bolt out of the blue" attack (Ref. 30). And they have concentrated on the farfetched objective of intercepting all of the warheads in such an absurd attack.

SECTION 10

PLAUSIBLE THREATS TO WEST EUROPEAN SECURITY

Much more modest and achievable objectives are relevant to deterring the most plausible Soviet attack; these would be directed at removing military obstacles to an invasion they might make in the Eurasian periphery.

The Hoffman report and PAN's subsequent research stress the utility of having some defense against the ballistic missile threat to Europe. The Europeans understandably are most concerned about a defense against the growing ballistic missile threat against Western Europe which they are likely to think of as an extension of existing defenses against manned and unmanned aircraft. Pan Heuristics has always been concerned with both.

The more likely Soviet attacks might use ballistic missiles to achieve a high confidence of destroying military obstacles (either in the United States or in Europe) to an invasion of Europe. Against such attacks, a more modest ballistic missile defense could form an effective component of a robust NATO posture that included an offense capable of responding selectively against military targets in the Warsaw Pact, including the Soviet Union. Such a defense of Western military facilities (which are always redundant in a way that population is not) could deprive the Soviets of the confidence they would require that they could destroy a large enough proportion of the military obstacles that stand in their way. Such a defense could, therefore, help to deter Soviet attack.

The Soviets will have ballistic missiles capable of delivering conventional as well as nuclear warheads effectively. Ballistic missile attacks with non-nuclear warheads could be an important element of the

initial wave in a Soviet invasion of Western Europe. Such attacks would exploit the fact that key elements in NATO's conventional force posture for many political reasons are less effectively dispersed and protected than the Warsaw Pact forces. In order to obtain a robust conventional posture in West Europe, we should consider urgently the early deployment of ballistic missile defense there. Such a defense is not proscribed by the ABM Treaty which is directed at restricting the defense against strategic ballistic missiles. The Soviets, moreover, are in the process of developing, testing and deploying such a defense. (Raymond Garthoff, a strong supporter of MAD and the ABM Treaty, has said that the Soviets have already tested their anti-tactical ballistic missile against their Scaleboard, an offense missile of roughly the same range as the Pershing I (Ref. 15).)

Moreover, contrary to statements made by many British supporters of MAD at the time of the UCS report, the job of defending against ballistic missiles such as the SS-22, SS-23, and SS-20 that threaten targets deep inside Western Europe, is not much harder than the job of defending the United States against ICBMs. In several respects it is easier. This runs counter also to the common impression that because tactical ballistic missiles take less time to get from their launch point to target, they would be harder to intercept. However, such missiles reenter the atmosphere at much slower speeds than ICBMs. They spend a larger proportion of their time on trajectory in the atmosphere, in the boost phase as well as after reentry. They have more difficulty in deploying persuasive decoys for several reasons. Because these missiles are launched from much closer by, even sensors on an airborne as distinct from a space platform should

be able to track them from the boost phase on. In fact the Airborne Optical System, which could supplement the AWACs Airborne Warning and Control Aircraft recently deployed in NATO, would be a particularly promising and early component of a layered preferential defense of theater targets.

For that very reason, we may expect that those who are committed to MAD are likely to oppose the Airborne Optical System in particular and ballistic missile defense in general, in the European theater. Political leaders, fearful of rocking the boat, may do the same.

SECTION 11

US STRATEGIC NUCLEAR FORCES AND ALLIED SECURITY

The French strategic force, as originally conceived, was a small force directed at destroying Moscow's population in response to an attack which it assumed would destroy France. It was a "dying sting." The French explicitly regarded their force de frappe as useful only as a last-ditch deterrent to an attack on France, not as a deterrent to an attack on any of its allies. The father of the French Force, General Gallois, claimed that any such suicidal retaliation was not credible as a response to an attack on an ally which by implication had not touched France. In the INF negotiations this argument was advanced by the French and the Americans as the reason for not including the French force in the matching of NATO INF with the Warsaw Pact, or Soviet INF. Moreover the British made the same argument about the British independent deterrent: it had nothing to do with NATO and was a last ditch deterrent to an attack on the United Kingdom.

The value of a suicidal threat to defend any country from an enemy attack may be questioned if the attack is selective enough to leave that country a stake in survival, that is, in avoiding suicide. The French and British position is most obviously sensible in recognizing that an attack directed solely at an ally plainly would leave them such a choice, and in that circumstance no responsible political leader would choose national suicide. But thirteen of the countries in NATO have no nuclear weapons and they clearly depend for deterring a Soviet nuclear attack on a credible nuclear response from a country that has nuclear weapons, that is, on the United States, and the possibility of the US using them without

committing suicide. It is extraordinary, therefore, that so many of the political elite in France and England recommend that the United States adopt a policy of making its responses suicidal. Of course, Britain and France as well as the rest of European NATO depend on the US nuclear guarantee even against overwhelming conventional attack and not merely against selective Soviet nuclear attack.

Today the French and the British, who adopted a policy of suicidal attack on population centers, in part because they felt they had too small a nuclear force to be used against military targets, are now in the process of greatly expanding their nuclear force to perhaps 1000 warheads apiece. Moreover, they recognize that the Soviets are increasingly in a position to make a direct attack on France and Britain with precise long range non-nuclear weapons or extremely accurate low yield nuclear weapons which would give France and Britain an option of survival rather than suicide. The French, therefore, have been moving towards an explicit policy of developing a precise nuclear force capable of destroying key Soviet military forces and a policy of responding to selective attack in non-suicidal ways. As Laurence Martin has pointed out, during the debate at the end of the 1960s and 1970s, the British and the French opposed the development of ballistic missile defenses in the United States and supported the severe constraints imposed by the ABM treaty on even an active defense of US silos for fear that their independent nuclear forces might look less persuasive as a threat to Soviet population--again on the ground that an American ballistic missile defense of its silos might be greatly extended to cover population centers in the United States and might be emulated by the Soviets in a defense of Moscow. Today France, England and

other European powers in NATO contemplate a defense against the ballistic missile threat to their own military forces in Europe. It would be absurd for them to attempt to assure that the United States would not be able to defend military forces in the continental United States, simply in order to make slightly more credible the French and British suicidal threat against population centers in Europe.

It is a symptom of the strategic disorder in the West that policy decisions critical for alliance defense are so largely shaped by the desire to quiet domestic dissent no matter how irrational, and to avoid potential disagreements among the allies even at the expense of surrendering critically needed measures for Alliance defense. Arms control, in particular, has become a means for "managing" (that is trying to appease) the utopian apocalyptic anti-nuclear movements. At the same time, the apocalyptic image of war spread by proponents of agreements designed to assure mutual destruction only assures new waves of passionate opposition.

The defects of a worst case strategy are most obvious in connection with the problem of defending the vital interests of NATO. The US strategic force was designed from the start to protect such interests. NATO started with the idea that if the Soviet Union attacked Western Europe, the United States would respond against the Soviet Union with "strategic bombing promptly by all means possible with all types of weapons without exception (Ref. 19)." That was central in the "Strategic Concept for the Integrated Defense of the North Atlantic Area" which was agreed to in between the signing of the NATO Treaty and its ratification. The phrase, "all types of weapons without exception," of course, was meant to include most plainly, nuclear weapons. The Military Committee dropped

the explicit mention of the A-bomb, despite the desire of the Belgians, Italians, and Dutch to make it explicit, only because of the domestic political sensitivities of the Scandinavians (Ref. 21).

Nonetheless, all of NATO's founders had made it quite clear. They depended on the then new American technology of nuclear weapons as a principal way to deter or to respond to a Soviet attack on Western Europe. Specifically they were relying on the American strategic offense nuclear force to compensate for the current preponderance of Soviet conventional military force and for an intrinsic geographical disadvantage the fact that Western Europe was much further from its major ally than it was from its principal potential enemy.

Joe 1, the first Soviet nuclear explosion, also occurred in between the signing of the Treaty and its ratification and even before the Military Committee developed the NATO Strategic Concept. The prospect that the Soviets would develop a large stock of nuclear weapons of their own, as Dean Acheson noted even then, in 1949, made a continuing heavy reliance on nuclear weapons to deter a Soviet conventional invasion questionable (Ref. 20). But it only underlined the importance of an American nuclear guarantee embodied in the Treaty. Credible promises of a nuclear response would be needed at the least, from then on, to deter Soviet nuclear attack against any NATO country that had no nuclear weapons. As the Soviet stockpile grew, the United States and NATO made it evident that the Strategic Concept applied also to deterring or answering a Soviet nuclear attack on one or more of the sovereign countries in Western Europe.

Dean Acheson's thoughtful memorandum, dictated shortly before the ratification of the NATO Treaty, suggests both the long history of our

dependence on nuclear weapons and the early recognition by the founders of NATO that a continued predominant "reliance upon the atomic defensive shield" was likely to "prevent progress toward the substitutes...". He asked "Is it true that within 5-10 years the USSR may be expected to have a stockpile of atomic weapons of sufficient size effectively to neutralize the present advantage which we possess and might this time be shortened if the USSR developed a thermonuclear reaction? ... If this is so, would we be better off addressing ourselves now to finding substitutes for the defensive shield our atomic weapons are now giving our allies?"

If not in 1949, then perhaps in 1987 we should be ready to think about how to supplement the atomic shield.

Several observations are in order. First, on the phrase, "extended deterrence," which unfortunately became common in the strategic debate about 25 years ago. It has always been misleading. The phrase suggests that the original purpose of the US strategic force was to deter an attack on US cities. And that the notion of extending its purpose to the defense of Europe was a later and quite doubtful stretching of the original idea. Not so. The Soviets are not likely to attack the United States in the hope of occupying it. They might attack American military forces in the United States or in Western Europe which stood in the way of their invading Europe. (Just as the Japanese attacked the US fleet in Pearl Harbor because it stood in the way of their expanding to the South.) The US strategic force was intended from the outset to deter or defend against a Soviet invasion of Western Europe. It was intended to compensate for the Soviet advantage in the theater and the instability that

advantage could mean.

Discussions of stability among American strategists and European political elites in the last two decades or so--including most mathematical "models" of stability--are frequently trivial because they neglect this obvious fact. They contract or shrink the initial idea of deterrence to an artificial 2-person game between the superpowers. Or perhaps between "Country A" and "Country B"--fabled in academia. In academia, Country A typically exhausts its strategic stockpile trying, for no stated purpose, to destroy the strategic force of Country B--and incidentally may destroy a large part of Country B's civil society. Country B automatically, without any need for an act of decision by its leaders, retaliates by destroying Country A's cities. Because such models assume the decision to retaliate is automatic, some British writers have described this sort of deterrent as "passive." Herman Kahn called it a "Type 1" as distinct from a "Type 2" deterrent. A Type 2 deterrent is not supposed to be automatic nor does it have to be immediate. For Type 2 deterrence, Kahn said, "There is no need to promise to destroy the enemy within fifteen minutes. It is perfectly all right to promise to destroy him somewhat later (Ref. 18)."

In such discussions, a deterrent force of either type is generally assumed to promise revenge against an adversary's cities--"to destroy him." But that, as Kahn said, suggests that American leaders "might be deterred from attacking the Soviet heartland even to avenge a Soviet attack on Europe." As well they might if it meant the United States too, would be destroyed. But since even a "Type 1" deterrent in reality requires decisions actually to respond, our leaders should be deterred by

the prospect of committing national suicide even in reply to an attack on the territory of the United States that left its civil society essentially intact.

All such models of deterrence are quite sterile. They bear almost no relation to the main plausible circumstances in which either the Soviet Union or the United States might use nuclear weapons--for example, as an outgrowth of a conventional invasion to expand Soviet control over Europe --and no relation to the objectives which either side might reasonably have in using nuclear weapons in such circumstances. In the real world the Soviet Union might be tempted to use nuclear weapons to overcome military obstacles in the course of a conventional invasion through the North German plain, and through the Low Countries, or more likely on a flank of Western Europe, or in the Persian Gulf. And they might be deterred by the prospect that the Western leaders--without destroying the Soviet Union or the West--could responsibly decide to reply in kind and defeat such an attack.

Second, the NATO Strategic Concept, like the NATO Treaty, was intended to deter Soviet attack and thus prevent a war. However, in the event of a Soviet attack it was understood that SAC would use its nuclear weapons. There was no flim-flam about nuclear weapons serving only to deter nuclear war, never to fight it. "Deterrence Only"--the notion that the West should threaten the use of nuclear weapons, but never actually use them if the threat didn't work--received some official sanction as a declaratory policy in the United States rather recently--in the 1970s; and then with substantial confusion. It had already begun to dominate the views of political elites in Europe. But, when Robert McNamara, in the

mid-1960s, introduced the idea of using threats of Mutual Assured Destruction, he also made clear that if deterrence failed the United States would use its strategic force not against cities but against Soviet military forces. He would actually use nuclear weapons. (He had not yet come explicitly to "Deterrence Only.") But he would use them against military forces, not cities.

But McNamara used the confused rhetoric of Mutual Assured Destruction. And rhetoric has its effect even on the rhetoricians. It is hard for our political leaders to keep single books straight. Double books may be impossible. The suicidal rhetoric of MAD encouraged Western governments and especially the American government to strip themselves of defenses, and to neglect the powerful trends in the technologies of sensing, information and control which have increasingly made feasible both active defense and a selective and discriminating offense. Even more it encouraged Western leaders to ignore the significance of the fact that the Soviets were vastly increasing their power to make a Western unrestrained response to a Soviet selective attack an unthinkable disaster for the West; and that, at the same time, the Soviets were building a capability to execute attacks which might achieve important political military objectives and yet fall far short of causing the apocalypse. It would remain to us to bring on the apocalypse. Or surrender. Concentrating always on the worst possible case of an attack that destroyed the civil society within the territorial bounds of each of the major countries in NATO, the West has tended to disarm itself for responding to the real dangers and especially those outside the immediate boundaries of the three nuclear powers.

The phrase "Mutual Assured Destruction" deliberately obscures the fact that the victim of a nuclear attack is by no means sure to respond with nuclear weapons to that attack. (He might give up.) And it obscures the fact that even if nuclear weapons are used by both sides, it is by no means certain that decisionmakers on either side would let destruction get out of all control. Worse still, it obscures the choice we have (which we ought to exercise) of improving our ability to reduce the harm we might do to civilians by nuclear attacks on military targets through increasing our precision, discriminateness and control and by trying to exercise control if the use of nuclear weapons is forced upon us. Finally, advocates of a mutual assured destruction capability (MADCAF) declaratory policy weaken both the deterrent and the possibility of discrimination by seeming both to threaten attacks directly on cities and at the same time promising to try to avoid cities and confine attacks to military targets. Because McNamara talked about attacking cities or the capability of destroying cities, he did not seriously pursue the technologies that would have made it easier to avoid destroying cities and more feasible to contain the harm done to the West. He talked more about our capability to respond by inflicting ruin and less about its credibility. And he came to talk less and less about precision while his followers actually opposed discriminateness. He abandoned even a "thin" defense of the United States useful against ballistic missiles of the sort likely to be acquired by Third World countries. And he and his followers even abandoned the defense of our offense force. The United States more than any other major or middle power in the East or the West gave up active defense even against manned and unmanned aircraft. The declaratory policy

of MADCAP collapsed to the declaratory policy of MAD. And then, almost inevitably has been collapsing into a call for no use of nuclear weapons at all, first or second, early or late.

SECTION 12

CONCLUSION

There will always be an irreducible chance of an enormous disaster, but we should act to decrease rather than to increase this possibility in the event of war. The Soviets can be deterred by lesser threats than total destruction from doing what they may want to do against the West. The possibility of total destruction will hang over them as well as us. That possibility is not large enough to preclude all potential uses of nuclear weapons by the Soviets. Most plainly it will not remove the temptation for the Soviets to use nuclear weapons in places that are important for the West as well as the East, but remote from the major cities of all the nuclear powers, and where the Soviets may have run into trouble in the course of a conventional incursion. To remove that temptation, we don't have to threaten universal ruin. We merely need to make it credible that using nuclear weapons will risk more than not using them. But we do have to look beyond the narrow boundaries of our own homelands. Sometimes even beyond the boundaries of NATO.

The situation in NATO today in many respects resembles the one Colonel DeGaulle tried unsuccessfully to warn the French General Staff about before World War II. The strategy of France (the General noted in his memoirs) corresponded to the moral weakness of the Third Republic. It was dominated by the concept of defending the fixed and continuous frontier of France. By proclaiming the French intention to keep its armies at the frontier, it was egging its enemy on to act against the weak areas isolated by that strategy: the Saar, the Rhineland, Austria, Czechoslovakia, the Baltic States, and Poland, and, in the end, even the Netherlands

and Belgium. If war came the strategy was to fight as little as possible. In a way it combined the worst of two strategies. It involved extending guarantees to weak states who were depending on France --and on whom France ultimately depended--and, at the same time France was following a course of action that indicated that the guarantees would not be fulfilled.

It is unfortunate that not only France and General DeGaulle, but the United States and the Alliance as a whole, have so far ignored the Colonel's advice.

SECTION 13

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