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AMERICAN NUCLEAR STRATEGY: A SELECTIVE ANALYTIC SURVEY OF THREA--ETC(U)

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September 1979

AMERICAN NUCLEAR STRATEGY: A SELECTIVE ANALYTIC SURVEY OF THREAT CONCEPTS FOR DETERRENCE AND COMPELLENCE

Michael W. Kanzelberger

A Rand Note
prepared for the
United States Air Force

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This report

Surveys analytically selected nuclear strategies proffered in the unclassified literature since World War II. Types and subtypes of strategies are identified and analyzed on the basis of the threat concepts that underpin them and the targeting schemes that back them up. Entries are catalogued according to whether the implied threat promises to punish, deny, or compel adversary actions, roughly in order of the amount of destruction suggested by the accompanying target plan, from greatest to least intended trauma. Each entry is then followed by one or more abstracts of selected works seminal to, or representative of, that particular variant, highlighting assumptions about the relationship of the threat design to U.S. political objectives and tracing the implications carried in the event that the weapons must be used,
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PREFACE

Issues of national security, particularly those associated with the acquisition and potential use of nuclear weapon systems, have enjoyed a wider audience of late owing to the political prominence of the U.S. debate over strategic arms limitations. Although a fairly small number of persons in and out of public service have achieved a deep comprehension of complex strategic concepts formally and by experience over the years, many others are only newly interested in the subject. This note is directed to the latter group. Its purpose is to present a brief survey of some of the many contributions to nuclear strategy in the American public literature since World War II, and an analytic framework by which to distinguish among them. The analytic construct provided here is, of course, not the only one possible. Nevertheless, it may be useful for ordering thought about a complex subject.

This note was written as background support for the Project AIR FORCE research project entitled "Strategic Policy for Long-Term Competition."

SUMMARY

This note surveys analytically selected nuclear strategies set out in the unclassified literature since World War II. Types and subtypes of strategies are identified and analyzed on the basis of the threat concepts that underpin them and the targeting schemes that back them up. Entries are catalogued according to whether the implied threat promises to punish, to deny, or to compel adversary actions, roughly in order of the amount of destruction suggested by the accompanying target plan, from greatest to least intended trauma. Each entry is then followed by one or more abstracts of selected works seminal to, or representative of, that particular variant, highlighting assumptions about the relationship of the threat design to U.S. political objectives and tracing the implications in the event nuclear weapons must be used.

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I. INTRODUCTION

With a series of difficult debates on the limitation of strategic nuclear arms yet to be resolved, more people in and out of government service are seeking a greater comprehension of complex strategic concepts. This note presents both a brief survey of some of the many contributions to nuclear strategy set out in the American literature since World War II and an analytic framework by which to distinguish among them.

The conceptual structure used here is not a formally tight hierarchy. Imposing a coherent order on a set of concepts where there is none would only distort them. Rather, entries simply follow a rough ordering within major categories as in a catalogue. This arrangement permits a comparison that does a minimum of violence to individual contributions, allowing each to begin from the special concerns and assumptions that spawned it. In the interest of brevity, this survey merely suggests the wealth of insight generated by Americans concerned about the use of their nation's most notorious contributions to the advancement of technology.

This note is not a chronological guide to the outcomes of the U.S. strategic policy process. However, the reader will easily see that of the writers selected, some found immediate acceptance for their ideas in government policy circles, some anticipated policy shifts that were much later in coming but themselves played no role in affecting the transition, and a few carried concepts to extremes that were logical but not workable in the political-strategic environment for which they were intended. Those writers selected for presentation

here were chosen on the basis of how their concepts diversified American thinking about the world's most pressing problem, and not according to their influence on the U.S. strategic policy process.

A nuclear strategy is considered here to be the rationale that directs threats to the leadership of adversary nations and integrates the policy elements that assemble, position, and target the nuclear weapon systems backing those threats up. The threats are designed to prevent other nations from taking actions inimical to U.S. interests, or conversely, to induce them to behave beneficially for the United States.

Those who formulate nuclear strategies usually intend to advance national interests without resorting to detonation of any weapons. New purposes require new threats. Altered threat rationales are supported by an adjustment of the policy elements that influence research, development, acquisition, or deployment of nuclear weapon systems or by a tuning of the policies for use of those weapons already in the inventory. Under this process, then, two characteristics are fundamental to nuclear strategies: the formulation of the threat and the employment policies guiding the potential use of the weapons. There are of course other characteristics that might be used to classify strategies.

Analysts concerned with the U.S. strategic position in the international arena have searched for the optimal nuclear threat first to forestall a direct attack upon the United States and second to guarantee other national interests, such as the national integrity of NATO allies. They have come up with threat formulations based on three

general concepts: punishment, denial, and compellence.[1] The threat to punish an adversary is intended to deter him from attacking by altering his calculations about what his net gain would be if the United States destroyed important assets within his homeland or within other areas critical to his national interests. With the threat to deny a potential enemy his objective if he attacks, U.S. defenders attempt to critically lower his estimate of the probability of success by promising to engage in counterforce or countervailing moves to forestall the aggression. Finally, if U.S. leaders want to compel an adversary to undertake behavior beneficial to American political objectives, they would increase the risk and scope of armed assault until they elicit the desired response.[2] Of course, if the adversary is insensitive to the manipulation of these threats, American leaders must use the weapons themselves or else back down, or develop an alternative strategy.

These three basic strategies have variants that can be distinguished in terms of three parameters constraining the physical possibilities for application of nuclear arms, namely: (1) What is to be destroyed? (2) How much is to be destroyed? (3) What is to be the timing of destruction? Generally, answers to the first question are distributed among four target categories: people; economic base (e.g., industrial capital, cities); general purpose military (e.g., airfields, troop concentrations); and strategic military (e.g., command and control bunkers, missile silos). The amount of destruction con-

[1] For an analysis of the concepts of punishment and denial in the nuclear context, see Snyder, 1961.

[2] For an explanation of the concept of compellence, see Schelling, 1966.

sidered on a large scale varies from wholesale annihilation of every conceivable target for which there is an available warhead to liquidation stratified within or across the categories cited above. On a small scale, possibilities range from demonstrative strikes limited to the direct and collateral damage in and around one city to the "surgical" removal of something as small as an oil refinery with little or no collateral damage. The timing of destruction varies from preventive initiatives selected at U.S. discretion to instant response, or even considerably delayed reactions. Although these parameters do not comprehend the subtleties of the commitments implied in each strategy, they are useful distinctions.

In the selective survey of nuclear strategies, entries are catalogued as nominal subtypes of the basic punishment, denial, and compellence formulations and are ordered with respect to the quantity, type, and timing of destruction, proceeding from greatest to least trauma. Identification of each strategic subtype is followed by one or more abstracts of selected works seminal to, or representative of, that particular variant, highlighting assumptions about the relationship of the threat design to U.S. political objectives and tracing the implications in the event the weapons must be used.

II. DETERRENCE BY PUNISHMENT

A deterrent based on the threat of punishment acts on an adversary's estimate of the costs associated with an attack, but may have no effect upon whether or not he attains territory or some other object of aggression.[1]

Some variants of punishment strategies promise to upgrade destruction at measured intervals until the aggressor returns to the status quo ante, but most leave the threat open to question by declaring possible large-scale reactions regardless of the infraction and whether or not the assailant might relinquish his gains. In formulating either threat, the deterrer affects cost calculations a priori to thwart the aggressor's temptation to act. What happens if the opponents run their cost calculus differently, say by reason of irrationality or inconsistent value structures, is a big question. Another problem, one that strikes continually at the credibility of threat formulations based solely on punishment, is how to construct a nuclear sanction that is sufficiently burdensome to prevent major alterations in the status quo and at the same time constrained enough to be invoked in case of limited aggression.

Targets are chosen as likely to strike sobering thoughts into those who would attack according to the deterrer's estimation of what his adversary values most. The strategists covered in this survey have usually asserted the worth of a given target type and evolved the retaliatory methodology from that point. Although one strategic analyst may posit the sanctity of economic and cultural assets to the

[1] This formulation is derived from Snyder, 1961.

adversary and target urban concentrations, another may believe that loss of military assets will be more critical. The difference in target selection can be explained partly by a difference in threat perspective: one seeks to invoke the sensibilities common to society at large; the other is directed at assets valued most immediately by military policymakers.

In the catalogue and analysis that follows, deterrence by punishment strategies are grouped by level of destruction required to carry out the threat in the event of deterrence failure. Level of damage can be considered simply as a rough aggregate of what and how much is to be destroyed. The entries proceed from greatest and most spasmodic to least and most controlled in potential damage.

A. TOTAL, ALL-OUT, SPASM PUNISHMENT

Punishment strategies expressed in these terms envision military response to employ if not all available strategic retaliatory forces, at least enough to create vast amounts of damage not necessarily tied in upper limit to the initial provocation.

1. Massive Retaliation

Still frustrated at the high costs for no apparent win in Korea, U.S. officials in the Eisenhower administration looked for a cost-efficient way to both save the free world from being "nickle and dimed" to death by Communist subversion and deter a direct surprise attack on the U.S. homeland and Western Europe. "Massive retaliation"

became the outgrowth of a wish for a total solution.[1]

Targeting: What? How Much? When? Reporting on "some basic policy decisions made by the National Security Council in 1954," Secretary of State John Foster Dulles declared that with respect to U.S. defense strategy:

The basic decision was to depend primarily upon a great capacity to retaliate, instantly, by means and at places of our own choosing.[2]

The principal intent was to deliver devastating nuclear attacks on anyone who would dare attack the United States, on agents of local aggression at the periphery of the free world, or on whom- ever the U.S. perceived to be the sponsors of local aggression. In practice, even in the late 1940s and early 1950s when nuclear stockpiles were limited and consisted of fission bombs, the Strategic Air Command targeted military assets as well as cities. Alpha and Delta target systems were large and soft (i.e., cities), and Bravo target systems consisted of general purpose ground forces that could be blunted on the ground before doing too much damage. Similarly, although the pace of retaliation was labeled "instant," practically speaking this could only mean that after some provocation the United States would preempt the Soviets so as to make as much mileage out of surprise as possible.

[1] For a cogent analysis of the concerns of the Eisenhower administration in formulating the doctrine of "massive retaliation," see Brodie, 1959.

[2] Dulles, 1954.

Assumptions and Implications. Dulles' announcement was predicated on the belief that strategic nuclear weapons could deter any type of war where there was any chance that they might be used. Further, the doctrine assumed that the United States would be uninhibited about introducing strategic nuclear weapons to serve interests less "vital" than the defense of North America or Western Europe. Eisenhower's deep concern about the ability of the U.S. economy to bear the burden of military expenditure formed an operating assumption that valued limiting forces to some reasonable minimum. Heavy reliance on nuclear weapons would supposedly prevent a massive conventional buildup. Accordingly, Dulles justified "massive retaliation" this way:

Now the Department of Defense and the Joint Chiefs of Staff can shape our military establishment to fit what is our policy instead of having to try to be ready to meet the enemy's many choices. And that permits a selection of military means instead of a multiplication of means. And as a result it is now possible to get, and to share, more security at less cost.[1]

"Massive retaliation" also was in accord with the military's revered principle of never yielding the initiative to the enemy. Under the doctrine, the military did not have to fight at the time and place of the adversary's choosing by limited means, as in Korea, but much to their liking could regain the initiative even against local aggression.

[1] Ibid.

The irony of Dulles' announcement of what was more or less presumed to be the U.S. policy at the time was that it came just when this strategy should have been phased out. Massive retaliation seemed more appropriate for an era of U.S. monopoly or massive superiority of nuclear weapons and their means of delivery. Even in the face of a growing Soviet nuclear arsenal, few doubted the credibility of U.S. counterstrikes on Russian cities in response to attack on the U.S. homeland or Western Europe. But with respect to situations that were short of desperate, this formulation seemed to suffer. If U.S. policymakers could not find sufficient justification to invoke nuclear weapons in Korea's limited war environment before Dulles' declaration, how could anyone be sure that they would deliver these weapons on a global scale for limited transgressions after the speech? The central question concerning credibility focused on a critical assumption of the strategy: Would the U.S. policymakers indeed be willing to risk strategic devastation for active but not truly "vital" interests? Many, including Dulles himself upon subsequent consideration, were not "content to rely upon a peace which could be preserved only by a capacity to destroy vast segments of the human race." [1]

2. Assured Destruction, Finite Deterrence

By the eve of the Kennedy administration, the rapid evolution of nuclear weapons system technology had provided the

[1] See Dulles, 1957.

possibility for a "multiplication of [nuclear] military means" as large in scale as the conventional build-up the Eisenhower administration wished to avoid when it announced the policy of massive retaliation. In an effort to rationalize strategic force procurement around some identifiable upper limit and within some desired parameters of cost-effectiveness, the parallel concepts of assured destruction and finite deterrence were incubated.

Targeting: What? How Much? When? In 1965, Secretary of Defense McNamara measured assured destruction of potential adversaries in terms of eliminated population and industrial capacity. The 200 largest urban areas in the Soviet Union would be targeted because they contained about three-fourths of the industrial capacity. Following a Soviet strike, the U.S. strategic forces would destroy about 80 percent of Soviet industrial capacity and create up to 115 million fatalities assuming 400 one-megaton warheads were delivered on target. The response time varied from rapid reaction measured in terms of minutes to more graduated options measured in days or months. Although only a portion of the ICBMs or SLBMs and no bombers would be required to achieve assured destruction, "the remaining elements of the strategic offensive forces [were] procured because it [was] believed they, along with air defense forces, [would] limit damage in the event deterrence failed." Targeting of the remaining warheads would be directed therefore against enemy delivery vehicles at their launch sites to meet the supplemental objective of damage limitation.[1]

[1] McNamara, 1965.

Assumptions and Implications. It seemed to McNamara:

reasonable to assume that the destruction of, say, one-quarter to one-third of its population and about two-thirds of its industrial capability would mean the elimination of the aggressor as a major power for many years. Such a level of destruction would certainly represent intolerable punishment to any industrialized nation and thus should serve as an effective deterrent.

After providing for this assured destruction, further force procurements would be justified for their contribution to damage limitation.[1]

The key to maintaining the credibility of assured destruction at the strategic level was to ensure the dependability of the nuclear offensive forces to conduct a second strike.

McNamara perceived four major factors to be critical to this:

(1) the percentage of the force that could respond immediately to an execution order; (2) the proportion of forces that survive a

[1] The nuclear umbrella in both the assured destruction and damage limitation aspects was designed to protect the United States and Western European allies from assault at the upper levels of the conflict spectrum. Yet Kennedy, McNamara, and Maxwell Taylor felt that assured destruction at the strategic level had a massive finality as a deterrent doctrine that was not credible for threats at lower levels of violence. For this reason, many force options were sedulously pursued to enable the United States to threaten reaction wherever and however an enemy might choose to strike. To deter the Soviets from embarking upon conventional attacks for limited objectives in Western Europe, the United States fielded more armored divisions, and to deter them from sponsoring insurgency in lesser developed countries, also created the Special Forces, to illustrate just two efforts to shore up deterrence.

first-strike intact; (3) the probability that surviving forces will operate properly; and (4) the probability that a reliable delivery vehicle will penetrate enemy defenses to explode its warhead.

When these rates are within tolerance to assure a U.S. second strike in extremis, any reserve capability can be directed to limiting damage to U.S. cities. But aside from "balancing" residual authorized forces to neutralize enemy launch vehicles that for some reason have been delayed in getting off the ground after an initial salvo, it would be futile, according to McNamara, to seek a comprehensive "damage-limiting" capability. He put his reason succinctly in his 1967 posture statement:

At each successively higher level of U.S. expenditures, the ratio of our costs for Damage Limitation to the potential aggressor's costs for assured destruction becomes less and less favorable for us. Indeed, at the level of spending required to limit fatalities to about 40 million in a large first strike against our cities, we would have to spend on Damage Limiting programs about four times what the potential aggressor would have to spend on damage creating forces, i.e., his Assured Destruction forces. [1]

Thus if deterrence fails, the aggressor could expect horrendous loss of social and economic assets. But unless the enemy delayed his attack long enough for U.S. missiles to play a major damage-limiting role, there was no possibility of reducing U.S. fatalities to a level much below 80 million.

[1] McNamara, 1965, pp. 201-206.

Targeting: What? How Much? When? In 1969, P. H. Backus, then Executive Secretary of the Navy Ballistic Missile Committee, advocated striking "industrial concentrations of significance in Russia," bearing in mind that most of these were collocated with centers of governmental authority, communications, resource stockpiles, and populations. Attack size would vary from a "calculable upper limit" in that centers of Soviet industry did not exceed 200 in number, down to strikes against two or three industrial clusters. Nuclear revenge would be "instant," for the Soviets would have it known to them beforehand "through diplomatic channels what they could expect in the way of retaliation should they initiate a general war." [1]

Assumptions and Implications. Backus assumed that to deter the Soviets from launching a nuclear attack upon the United States, "we must create a state of mind among the leaders of Russia that no matter how powerful their initial assault on us, we would have enough [nuclear striking forces] left to so devastate their homeland as to make an attack on us unprofitable." He believed that the best way to accomplish this was to promise assured destruction of industrial concentrations because: (1) "History . . . shows us that the desire for the safety and integrity of the Russian homeland itself generates probably the most powerful force, short of family loyalty, motivating a Russian"; and (2) "What is the sense of destroying an enemy ICBM base or bomber base after the birds have flown? The damage has

[1] Backus, 1959.

been done and little gain is to be derived from destroying empty nests."

The total strategic force level required to implement Backus' plan was finite and could be computed by working backward from an assessment of weapons effects to the amount needed to liquidate the Soviet Union's 200 principal industrial centers. Allowance would be made for those forces that were less than 100 percent reliable, down for repair, in logistics pipelines, used for training, and subject to attrition and fratricide. However, the most fundamental force capability was guaranteed survivability for a second-strike.

Although his threat formulation focused primarily upon developing an assured capability to devastate an aggressor, Backus showed himself sensitive to the lack of flexibility offered by the "all-or-nothing, massive retaliation blunting concept." Accordingly, after reaffirming that the Russians would be forewarned about what they could expect in the way of instant retaliation should they initiate a general war, he also offered the following possibilities:

Assuming that we wish to damage the surprise initiator of a general war only enough to force her to capitulate and that revenge is not our only motive, here is a controlled and flexible way in which this can be done without forcing us into national bankruptcy. Starting with the number of industrial concentrations which we deem sufficient to be convincing and working back through the simple calculation discussed above, we come out with the size and types of forces necessary to insure the destruction of the industrial concentrations selected.[1]

[1] Ibid., p. 28.

And additionally,

In the event the Russians accidentally initiate a general war, let us hit back instantly and hard by destroying two or three of the predesignated Russian centers . . . we need not and should not immediately retaliate with the major portion [of our forces.] Instead, we should proclaim immediately which additional Russian concentration[s] will be destroyed unless their attack ceases forthwith. If the attack does not cease within the specified time limit, the concentration is then destroyed.[1]

Backus also reasoned that because of the inevitable devastation of central war under this mode of deterrence, a limited war will increase in likelihood. Consequently, a portion of the savings enjoyed from developing a finite strategic posture should be used to augment "highly mobile, instantly ready, hard-hitting forces for putting out fires."

B. LIMITED PUNISHMENT

The foregoing strategies emphasized swift and devastating retaliation in their threat formulations in the belief that this would obviate the need to deliver on the promise. In practice, however, all allowed for some kind of limited response in the event deterrence failed, for the simple reason that few could feel comfortable being only one step away from the colossal

[1] Ibid.

catastrophe inherent in the spasmodic release of many nuclear weapons. Yet other strategists elected to emphasize the potentially limited use of nuclear weapons in their strategic punishment doctrines in the hope that the apparent ease and low cost of invocation would better scare adversaries out of designs inimical to the United States. In compensation, "limited use" adherents provided for quite sizable attacks in practice if deterrence failed on a grand scale. The difference between those who advocated total and spasmodic nuclear application and those who advocated initially measured use of thermonuclear weaponry is more one of doctrinal emphasis than of rigid posture development.

1. Proportional Retaliation

The concern of strategists who espoused proportional nuclear punishment was to fashion retaliation more closely to possible provocations. On the one hand they wanted to address the problem of credibility attendant on threats of massive retaliation, and on the other hand they wanted to incorporate a set of potential limitations in the conduct of nuclear exchange to save the world from conflagration if a "brush fire" ever spread.

Targeting: What? How Much? When? In the mid-1950s, Warren Amster, an analyst for the Convair Corporation, and C. W. Sherwin, then Chief Scientist for the Air Force, advocated restricting retaliatory strikes to cities at a level considered proportional to the original damage inflicted by the aggressor, at

whatever pace would guarantee delivery of the punishment.[1]

Sherwin interpreted the rules of Amster's strategy to be:

-*

1. Do not start strategic bombing unless provoked by receiving a strategic attack;
2. If cities are attacked, respond by the same number of detonations on the attacker's cities; and
3. If U.S. or NATO bomb carriers are attacked, those destroyed will be counted, and exactly that number of carriers will be sent to bomb the aggressor's cities.[2]

Assumptions and Implications. Amster had assumed that there would be a high degree of invulnerability in strategic forces because of the impending reliance on intercontinental ballistic missiles as weapons carriers. Such systems were small, light, mobile, could be dispersed over continents and under the seas, and could be protected by hardening. Further, only a small proportion of the population needed to be similarly protected to operate these weapons in war. Amster and Sherwin felt that counterforce warfare was inherently inefficient because "failure to destroy the last 10 percent of the defender's forces can make the whole venture an utter failure for the attacker." [3]

On the contrary, "countereconomy" warfare they viewed as being very efficient because "the sprawling, 'soft,' immobile city created by compelling economic and social needs, now is

[1] These two writers are treated together because Sherwin presented the ideas of Amster to a wider audience in 1956. See Amster, 1955; and Sherwin, 1956.

[2] Sherwin, 1956, p. 161.

[3] Ibid.

vulnerable to even a single one of the very small and very cheap new weapons." Under these conditions, Amster argued:

Each side needs an optimum and not a maximum force. Larger or smaller forces actually reduce security. The traditional arms race therefore does not need to develop. If forces are very costly to attack, and cities are very cheap to attack, the optimum force will not be very large. If the forces become more vulnerable, and the economies more effectively protected, security is reduced. If this development is carried far enough . . . an arms race will develop and considering the nature of the new weapons--great advantage will thus accrue to the initial attacker.[1]

The purpose of this deterrent strategy was (1) to prevent the start of a strategic war; (2) to stop such a war should it start; and (3) failing this, to carry out a predetermined amount of destruction of the attacker's country. In an era of stalemate, the deterrent strategy based on measured strategic action was to be more credible than massive retaliation. If deterrence failed, proportional retaliation left enough forces in reserve to forestall complete conflagration. The strategy did not explicitly confront the problem of local aggression, concentrating instead on the possibility of deterring central strategic war. However, there was no reason in principle for not carrying the logic of proportional retaliation over to other interests valued by the United States, such as the territorial integrity of Western Europe.

[1] Ibid.

2. Limited Strategic Reprisal, Limited Retaliation

Encouraged by the same concerns as those who espoused proportional retaliation, advocates of limited strategic reprisal were willing to begin at levels of destruction below that occasioned by an initial provocation, in the belief that the spectre of even minimal use of nuclear weapons would carry with it enough fear of escalation to act as a credible deterrent. Most were willing to back up initial use of nuclear weapons with mounting punitive installments, however, lest a potential aggressor misperceive a reluctance to follow through in the event of large scale aggression.

Targeting: What? How Much? When? The eminent physicist Leo Szilard, in 1955, proposed striking evacuated Soviet cities in numbers agreed to by prior arrangement to correspond to the value of some area the United States was committed to defend. After a given transgression by an adversary, the inhabitants of an appropriate number of an opponent's cities would be given one week to evacuate before destruction would take place.

According to Szilard:

We need not engage any longer in the kind of warfare in which people are killed in order to protect some area which we are committed to defend. We shall simply list all such areas, with a price tag attached to each one, and we shall specify if Area No. 1, for instance, is invaded we shall demolish five medium-sized cities of the "enemy." If the "enemy" permits us to do this unopposed we shall name in advance the five cities to be destroyed and give each city one week's notice in order to permit their orderly evacuation. We shall expect the enemy to respond by bombing five medium-sized cities of our own and likewise to give us advance notice. If the enemy does not attack more of our

cities then the war will end there.[1]

Assumptions and Implications. Szilard's strategy was calculated on the assumption that the United States and the Soviet Union soon would achieve nuclear parity and successfully address the vulnerability of their strategic forces to surprise attack. He assumed the probability of a surprise attack was extremely low, but he thought nevertheless that it might be rational for the United States to deter the Soviets from such rash action by threatening massive destruction in retaliation. However, he doubted whether it was rational to execute such a lethal promise if the unlikely event did occur and was even more skeptical of the use of this threat against limited conventional aggression. Overall, what Szilard wanted was a deterrent scheme that would escalate the costs associated with aggression directed toward the U.S. defense perimeter while avoiding an uncontrolled escalatory spiral toward mutual annihilation by delimiting the price of defended areas in advance.

The burden of the strategy lay with the deterrer who had to define and price his assets within careful limits and still make the cost of alteration of the status quo so high that the aggressor would not come out ahead. If deterrence failed because of the defender's underevaluation of an area or because of miscalculation on the part of the aggressor, there was no mechanism under

[1] Szilard, 1955. p. 299.

Szilard's plan that would force the assailant to yield up the spoils of attack. Reinstatement of the status quo ante would require more than the requisite preestablished nuclear counter-exchanges. Rather, some form of continuing punishment would be needed to motivate the aggressor to withdraw. But insofar as sustained punishment would be likely to fuel the spiral Szilard sought to avoid, his threat formulation left only two options: (1) keep prices uniformly high and run the risk of questioned credibility, or (2) take your lumps if deterrence fails.

Targeting: What? How Much? When? In 1958 and 1959, University of Chicago Professor Morton Kaplan offered a targeting scheme where primarily cities would be hit in "a series of installments that eventually progress to reprisals double the value of Europe," or double the cost of lesser areas of concern to U.S. interests.[1]

According to Kaplan:

These (strikes) should be announced in advance. For instance, the first installment may be the destruction of some central Asian city in the Soviet Union. The advance announcement may even permit the evacuation of the city to avoid widespread loss of life and the consequent inflammation of tempers that would force matters out of hand. One variation of this strategy may permit the opponent to attack one of our cities in return without additional reprisal by us. If this does not produce agreement, then the schedule becomes progressively higher.[2]

[1] Kaplan, 1958, 1959.

[2] Kaplan, 1958, p. 41.

Assumptions and Implications. Kaplan joined Szilard in doubting the credibility of a deterrent strategy posited upon a single, massive retaliatory threat designed to extend nuclear deterrence to defense of local areas outside North America. But he also doubted Western capabilities to conduct local defense by nonnuclear means, considering the disparity between Communist and noncommunist conventional forces. Kaplan felt that if the Soviets were willing to push their luck with regard to escalation, they might attempt to take advantage of local conventional superiority. He reasoned that limited warfare would bring local U.S. defeat because even if the United States opted to escalate in the region, the West would be raising the ante in a local currency in which the Soviets were better heeled.

Instead of massive retaliation as a cure for inadequate local defense, Kaplan suggested a limited use of strategic nuclear power. Self-imposed restraint would address credibility by increasing the perceived likelihood of U.S. delivery on its threat, and use of strategic weaponry would contend with local inferiority by playing against a bigger U.S. line of credit. As Kaplan put it:

War cannot be confined to the battle lines or limited zones behind the lines. Nor is it desirable to attempt so to confine it. If the opponent has local superiority or even if he has only parity, but a parity that threatens to be disastrous for oneself or one's allies (for instance, consider the damage stemming from a non-nuclear war or a war with tactical nuclear weapons that rolled back and forth over the area of Western Europe several times running), one may rationally attempt to raise the costs of continuing the war so

high that they will be prohibitive.[1]

With respect to the failure of deterrence, Kaplan's installment plan was unlike Szilard's strategy in that the total quantity of destruction, rated at roughly twice the value of a given defense area, and the delayed delivery schedule were designed to motivate the attacker to return to the status quo ante. However, he was fairly certain that deterrence would not fail, given "the certainty of destructiveness of nuclear weapons," and so long as the United States persevered to make their invocation ever more credible. To this end he suggested sharing the technology of "clean" bombs with the Soviets, "since a bomb with minimal fallout enables one to play the game with greater safety and to avoid those consequences which, by virtue of certain uncontrollable factors, might lead to an extension of hostilities."

Targeting: What? How Much? When? In 1961, while associated with Princeton University's Center of International Studies, Glenn Snyder divided strategic nuclear reprisal among three classes of targets: (1) cities, (2) strategic weapons, and (3) local tactical military units. Retaliation would consist of "single, small, successive nuclear strikes" directed against the Soviet Union or sponsored proxies after they initiated tactical ground aggression of major proportions. If Soviet cities were to be the targets, the threat would be formulated something like the following: One urban area of 200,000 population would be

[1] Kaplan, 1958. p. 40.

destroyed each day until the Red Army retreated to the status quo ante. If strategic weapon sites or local tactical concentrations were selected as targets, the timing would be similar.[1]

Assumptions and Implications. Snyder believed that the threat of a massive first strike to regulate Soviet behavior in peripheral areas was losing credibility because the Russian's growing ballistic missile capability would allow them to retaliate massively in a second strike. Coupled with U.S. inadequacy in crucial local tactical arenas, this left the United States short of options to deter and if necessary to punish Soviet limited aggression. Snyder suggested that the threat to begin limited reprisals was more credible as a deterrent than the threat to strike grossly. Naturally, the Soviets would retaliate against U.S. strikes, but the ensuing exchanges would be a form of bargaining in which each side would attempt to persuade the other to come to agreement before, and at the risk of, complete devastation.

The purposes of this strategy are, first, to deter the aggression by threatening such reprisals, and second, by actually beginning to carry them out if deterrence fails, to persuade the Soviets to cease and desist under pain of an eventual accumulation of human and material costs which would more than offset the fruits of their aggression. . . . In case deterrence should fail, each separate reprisal would be moderate in destructiveness, since its purpose would not be to punish the enemy immediately to a degree commensurate with his transgressions, but rather to demonstrate at minimum cost and risk to ourselves our will to make such reprisals and to suggest a willingness to continue

[1] Snyder, 1961, pp. 193-219.

making them beyond the point at which the aggressive venture became unprofitable for the enemy. Keeping the initial reprisals small would also provide maximum time and opportunity for the enemy to learn that he had miscalculated our intent and to change his mind and discontinue his aggression.[1]

Although it was more credible at the outset, in the event that deterrence did fail, limited reprisal offered a convincing interim threat that might stave off Armageddon. Unlike massive retaliation, which, if executed, would completely and finally fulfill a terribly destructive promise, delivery of the first limited strike would generate threat reinforcement of the strongest possible kind because it would involve actually beginning to deliver the promised consequences without chaining the world to an inevitably catastrophic course of events.[2]

Snyder included in his punishment construct tactical military assets near the front lines of local conflict as well as installations within the Soviet homeland because he believed that they were more plausible limited targets than cities. The destruction of strategic and tactical weapon concentrations would not fuel the escalatory emotions that a city strike would evoke and yet would serve as a warning that such city strikes would occur next. However, enemy force attrition would be a by-product of U.S. efforts to demonstrate resolve with minimum immediate costs and risks.

[1] Snyder, 1961, p. 193.

[2] Schelling felt that demonstration at small cost of a nation's willingness to carry out its destructive promises served as an effective reinforcement of an original deterrent threat. See Schelling, 1960.

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III. DETERRENCE BY DENIAL

Deterrence by denial operates on the premise that a potential aggressor will be dissuaded most by increasing the probability that any planned attack will fail, or cost more in attrition to attacking forces than the strategic objective is worth.[1] In contrast to punishment strategies, which deliver consequences post hoc, denial strategies call for engagement immediately upon attack to provide, if possible, reinstatement of the status quo ante. Threats to deny tend to be more credible than promises to punish for two reasons: (1) delivery need not incite the suicidal counter-reprisals that would occur when an adversary's cities, but not all of his weapon strength, were struck; and (2) in action they could at least reduce an aggressor's gains, if not frustrate him completely. So long as the defender can beat oncoming forces and has the resolve to use those means, deterrence by denial remains credible to a rational adversary and provides the only tenable insurance against one who is not.

Between deterrence by denial and punishment strategies, there are overlapping targets to consider for the defender and costs to ponder for the aggressor. A punishment strategy may include the targeting of military assets. If it is delivered powerfully enough, it might even foreclose some territorial gains because of the mounting costs of reprisals. When spoiling an attack, a nuclear denial strategy may punish through collateral damage; or even if precise in application it

[1] Snyder, 1961, pp. 41-42.

may escalate to punishment levels. What a defender intends to be a limited reprisal demonstrating resolve to punish if pushed may encourage an aggressor who perceives the strike as ineffectual denial. Conversely, what a defender intends as a circumscribed denial strike an aggressor may perceive as too large for that purpose and worthy of counter-reprisal simply for its own sake. The point is that denial and punishment will not always follow from counterforce and counter-value targeting operations, although that may be the intention.

The targets of a deterrence by denial strategy do tend to be military forces initially because they are the implements of aggression. At the strategic level, aiming points include missile launchers, command and control hubs, electronic sensors, and, if necessary, politico-military authorities. In local warfare, targets usually comprise invading ground, sea, and tactical air forces, forces, logistical support services, and battle-front command, control, and communications centers.

Below, deterrence by denial strategies are again registered roughly in terms of the level of destruction necessary to deliver the consequences of provocation. Denial attacks need a uniformly high degree of control and are paced at very fast tempos but in terms of timing of attack can be distinguished by whether they are to be launched on the basis of: long-range political, mid-range strategic, or short-range tactical indications of aggression.[1]

[1] As used here, long-range political indicators exclude explicit evidence of military preparations for imminent attack; strategic indicators apply to those moves taken by adversary military forces to prepare and position themselves for attack; and tactical military indicators measure the first signs of launch by enemy strategic or local forces.

A. TOTAL PREVENTION

On the eve of what was to become the Cold War, some U.S. strategists believed that the best way to deny the Communists world domination was to pound them into submission before they could carry out their master plan.

1. "Nuclear Monopoly Exploitation" [1]

Fearing for political reasons that armed confrontation with the Soviet Union was inevitable sooner or later, one group of strategists advocated exploiting the U.S. monopoly of atomic weapons and their means of delivery to subdue the Soviets before they attained strategic parity and dramatically altered the terms of conflict.

Targeting: What? How Much? When? In 1949 George Eliot advocated bombing nuclear production facilities and any other target required to bring about Soviet renunciation of these means of destruction. He declared that the United States should present the Soviet Union with an ultimatum to cease the production of nuclear arms and to accept international supervision or to be prostrated as a nation. [2]

Assumptions and Implications. Eliot and some military men advanced this strategy in the years immediately following World War II. They assumed that the outbreak of open conflict between the Soviet Union and the United States was only a matter of time. They also assumed that the Soviets would not hesitate to use

[1] Professor Samuel Huntington of Harvard (1957) suggested this category name and the following one in an article on preventive war.

[2] Eliot, 1949.

atomic weapons to further their cause once they had developed a sufficient arsenal. The central notion was to take advantage of the U.S. monopoly in nuclear arms before the "inevitable" took place.

2. "Avoiding Piecemeal Destruction"

After it became clear that one of the Communists' preferred tactics to advance their global interests would be limited aggressions, some strategic thinkers became preoccupied with the possibility that the United States could be nibbled to death, eventually losing great quantities of manpower and material. To forestall this fate, some experts advocated bringing the issue to a head by setting forth a comprehensive ultimatum that the Soviets could ignore only at great peril.

Targeting: What? How Much? When? In 1950, General Orvil A. Anderson advocated "neutralizing" the Soviet strategic power base (concentrations of population, industry, and transport) if they did not respond favorably to an ultimatum stipulating that they were to free the enslaved satellite countries of Europe and to stop subversion and aggression in Asia.[1]

Assumptions and Implications. After the outbreak of the Korean War, Anderson and others were concerned with the possible dissipation of American strength through a series of small wars with Soviet satellites. Because they assumed that the Soviet Union was pulling the strings on a master plan and in any case was the true beneficiary of satellite aggression, they were intent on forcing a showdown.

[1] Endorsed and quoted in Twining, 1966, pp. 18-22.

Representative Carl T. Durham, Vice Chairman of the Joint Committee on Atomic Energy, argued the issue in the New York Times, August 15, 1950:

Stalin would like nothing better than for us to become physically sapped and financially bankrupt by wasting our manpower and resources against his satellite nations.

I think that in the days to come the pattern will be sufficiently clear to tell us whether or not Russia is trying to defeat us through that process. If it becomes clear beyond all doubt that that is the Russian policy, then I say that we have no alternative but to go to war with Russia; in which event, we must pick the time and place.

Again the plan was to take advantage of the U.S. atomic lead. These preventive war advocates did not believe the Soviets to be in a position to offer effective resistance to a U.S. atomic assault.

B. TOTAL PREEMPTION--ANTICIPATORY RETALIATION

The difference between the categories implied by the terms "prevention" and "preemption" as used here rests on a temporal distinction. Preventive strategies were proposed before the Soviets had a significant atomic capability and could mount heavy attacks on the U.S. homeland. Preemptive strategies assumed Soviet possession of a sufficient number of atomic weapons to cause heavy destruction within North America and were to be carried out at the first signs of imminent Russian attack.

The desire on the part of military men to seize the initiative in time of war remained unqualified for many as Soviet

nuclear strike forces improved. The complacency associated with deterrence strategies based on a mutual hostage relationship between nuclear adversaries did not sit well with U.S. military officers who were anxious to blunt enemy strategic attacks on the ground. Consequently, some strategic analysts, mainly professional military men, offered defense doctrines that did not require the adversary to shoot first to activate U.S. attack.

Targeting: What? How Much? When?

Air Force General Ira C. Eaker and Navy Commander W. D. Puleston, and many of their military colleagues, believed that the best defense in time of crises was a good offense.[1]

If the Soviets seemed likely to attack the United States, Americans would have to seize the initiative and strike first. According to Lieutenant General Eaker,

If we are to prevent the launching of atom bombs, guided missiles, or super-rockets against our industrial establishments, we must have a force ready to destroy these weapons at their source before they are launched. [2]

Assumptions and Implications

Proponents of anticipatory retaliation assumed that there was no defense against atomic attack on war-making capability. If the United States were forced to concede the first blow to the

[1] Eaker, 1946, p. 10; Puleston, 1955, pp. 96-97, 127-130.

[2] Ibid.

Soviets, there was a very real chance American nuclear retaliatory power would be destroyed and, consequently, the nation would be defeated. In such a crisis situation, a decision to take preemptive action would be justified if it appeared that (1) a surprise Soviet attack would significantly cripple our retaliatory force; (2) the Soviets intended to make such an attack, and the attack was imminent.

Efforts to increase the security of each side's retaliatory force delayed serious consideration of this strategy pending breakthroughs in offensive technology.

C. REMEDIAL SECOND-STRIKE

Those who like Professor Thomas Schelling of Harvard believed that the reciprocal fear of surprise attack in a nuclear environment intensified if one or more adversaries developed a first-strike posture felt more comfortable with denial strategies premised upon letting the enemy provoke with the first blow.[1] Strategists of this school believed that the stability afforded by giving the adversary no reason for striking preemptorily was worth the risk of absorbing an initial blow in terms of long-range war avoidance. Of course, few ever expected U.S. forces to remain on the ground long after provocation. The following second-strike formulations all require a rapid and well-coordinated armed reply to break up successive waves of oncoming attacks.

[1] On the explosively interactive expectations that can lead to war in spite of the intentions of individual adversaries, see Schelling, 1958.

1. Controlled Strategic Counterforce

Strategists who occupied themselves heavily with the quantitative assessment of nuclear weapons effects doubted a central assumption of those who stressed the political ramifications of nuclear exchanges: that introduction of strategic nuclear weaponry to a conflict would probably lead to conflagration and that the "survivors will envy the dead." [1] Instead of saying, in effect, "After the button is pushed, nothing matters," the more technically oriented tended to believe that prudent battle management could limit damage to the United States in the course of nuclear exchange and could yield some outcomes very much better than others, even in general nuclear war. Strategies postulated on these beliefs attempt to deter by threatening to deny the adversary military victory in nuclear war through offsetting, rapid, and controlled counterforce strikes.

Targeting: What? How Much? When? In 1960, Henry Rowen, a prominent strategic analyst and government official, favored a "deterrence-plus-insurance" position that coupled plans to retaliate against civil populations with additional countermilitary offensive options to "fight a general nuclear war in a controlled way that might give the Nation some chance of surviving." He wanted to hit adversary strategic nuclear forces to break up an attack completely if possible, but at least to limit damage on the U.S. homeland. Rowen advocated smashing weapons before command and control assets to preserve the adversary's ability to

[1] Kahn, 1961, Ch. II.

retain positive force management for effective conflict negotiation. The timing of response would be a function of warning time and U.S. strategic force generation and connectivity under available technology.[1]

Assumptions and Implications. The central assumptions of deterrence-plus-insurance were that (1) a good deterrent posture against all out nuclear war is difficult to develop--the probability of war may be low, but it will never be zero; (2) general nuclear war does not have to be lethal to one or both participants; and (3) the United States may be able to effect outcomes of general nuclear war that are favorable compared with those resulting from doing nothing. Consistent with quantitative analysis of potential weapons exchange ratios, the strategy sought to distinguish between 50 and 150 million possible American deaths. Rowen assumed that the threat of an unfavorable military outcome, in addition to the threat of retaliation against civil targets, would project the best deterrent to war.

Deterrence of nuclear war could fail, according to Rowen, by more than a highly coordinated surprise attack. There may be warning or escalation from prior conventional rumblings. In this event, what the United States might influence generally with the proper posture and strategy would be war preparations, circumstances surrounding the outbreak of nuclear hostilities, war objectives, and the conduct of battle. However, insofar as the United States did not want to contribute to the reciprocal fear

[1] Rowen, 1960.

of surprise attack by developing a first-strike posture, the nation would have to develop a damage limiting system that consisted of active and passive defenses coupled to a nuclear force capable of controlled strikes. Rowen acknowledged that there would be difficulties in making such a strategy operational, though, because:

To actually fight a general nuclear war in a discriminating fashion would put a great burden on the planning, the equipment, and the emotions of both sides. It is by no means certain that a controlled war could, in fact, be fought.[1]

In any case, Rowen believed that a U.S. capability to fight nuclear war in a controlled manner would offer insurance that might dramatically reduce U.S. losses during the course of nuclear negotiation.

Targeting: What? How Much? When? On June 16, 1962, before the graduating class of the University of Michigan, Secretary of Defense Robert McNamara announced a shift in official U.S. strategy away from the concept of massive retaliation. What came to be known as the "no-cities" doctrine was first announced publicly in this way:

The U.S. has come to the conclusion that to the extent feasible, basic nuclear strategy in a general nuclear war should be approached in much the same way that more conventional military operations have been regarded in the past. That is to say, principal military

[1] Ibid., p. 40.

objectives, in the event of a nuclear war stemming from a major attack on the alliance, should be the destruction of the enemy's military forces, not of his civilian population.

The very strength and nature of the alliance forces make it possible for us to retain, even in the face of a massive surprise attack, sufficient reserve striking power to destroy an enemy society if driven to it. In other words, we are giving a possible opponent the strongest imaginable incentive to refrain from striking our own cities.[1]

Because the United States was not planning to strike first in this formulation, the efficacy of damage limitation for cities was critically dependent on the timing of enemy attacks on U.S. urban targets and the efficiency of U.S. strategic intelligence. If the military knew what Soviet missiles were yet to be fired, it might be possible to destroy some weapons on their launchers.

Assumptions and Implications. McNamara's "damage-limiting" formula was justified on the basis of an abiding concern with deterrence failure. It mattered not whether deterrence broke down as a result of deliberate, miscalculated, or accidental transgression; he believed that an effort must be made to salvage what was possible from dire nuclear circumstances. If the worst happened, the objectives were clearcut: do not strike enemy cities; do hit as many unused enemy strategic weapons as possible.

After several years, McNamara ended up abandoning study of a damage-limiting capability because, as he put it:

[1] McNamara, 1962.

At each successively higher level of U.S. expenditures, the ratio of our costs for Damage Limitation to the potential aggressor's costs for Assured Destruction becomes less and less favorable for us. Indeed, at the level of spending required to limit fatalities to about 40 million in a large first strike against our cities, we would have to spend on Damage Limitation programs about four times what the potential aggressor would have to spend on damage creating forces, i.e., his Assured Destruction forces.[1]

And in any case, no one was in a position to guarantee that U.S. cities might not be struck simultaneously with U.S. military targets as part of a Soviet move to cause as much strategic disruption as possible. In fact the Soviets rejected McNamara's initiative with the rejoinder that they expected any use of nuclear weapons to escalate to total use and would certainly not abide by what they said was a devious U.S. plot to "legitimize" atomic conflict. In response both to this and to Air Force requests for over 2000 Minuteman missiles to meet the postulated requirements of damage-limitation, McNamara returned to espousing a primary strategy of assured destruction, while retaining the capability for some flexible targeting for limited contingencies.

Targeting: What? How Much? When? In the spring of 1974, Secretary of Defense James R. Schlesinger publicly aired a shift in U.S. targeting doctrine toward a more flexible selection than that offered under assured destruction. It was intended to provide small, preplanned strikes against a variety of aiming points, including military assets, with the option of limiting

[1] McNamara, 1965, p. 201-206.

nuclear application "down to a few weapons." Although the U.S. nuclear targeting plans had included alternatives to massive city destruction since the time of the Eisenhower administration, subsequent modifications still involved large numbers of weapons not optimized to minimize collateral damage--and from the recipients' point of view would have been "virtually indistinguishable from an attack on cities." Although not seeking capabilities for a disarming first strike, Schlesinger did seek accuracy and yield improvements designed to enhance the efficacy and discrimination of U.S. nuclear forces against soft and hard targets for flexible use as U.S. political authorities saw fit.[1]

Assumptions and Implications. In his 1970 statement on foreign policy, President Richard Nixon asked:

Should a president, in the event of nuclear attack, be left with a single option of ordering the mass destruction of enemy civilians, in the face of the certainty that it would be followed by the mass slaughter of Americans? Should the concept of assured destruction be narrowly defined and should it be the only measure of our ability to deter the variety of threats we may face?[2]

Schlesinger's announced shift in targeting doctrine was directly addressed to this set of concerns.

The Secretary assumed that the chances of a massive surprise attack by the Soviets were remote, but lower level provocations that could escalate into a broader nuclear conflict were much

[1] Schlesinger, 1974.

[2] Nixon, 1970.

more likely. Further, he assumed U.S. maintenance of several strategic options would be a better deterrent than a single, blunt threat to destroy the Soviet economy. He believed a targeting doctrine that included low level nuclear responses would provide a more "usable" set of nuclear options and therefore would provide a more credible deterrent to a broad range of potential aggression. As Schlesinger put it:

Flexibility of response is also essential because, despite our best efforts, we cannot guarantee that deterrence will never fail; nor can we forecast the situations that would cause it to fail. Accidents and unauthorized acts could occur, especially if nuclear proliferation should increase. Conventional conflicts could escalate into nuclear exchanges; indeed, some observers believe that this is precisely what would happen should a major war break out in Europe. Ill-informed or cornered and desperate leaders might challenge us to a nuclear test of wills. We cannot even totally preclude the massive surprise attack on our forces which we use to test the design of our second-strike forces, although I regard the probability of such an attack as close to zero under existing conditions. To the extent that we may have selective response options--smaller and more precisely focused than in the past--we should be able to deter such challenges. If deterrence fails, we may be able to bring all but the largest nuclear conflicts to a rapid conclusion before cities are struck. Damage may thus be limited and further escalation avoided.[1]

Following this logic, Schlesinger reasoned that improvements in U.S. counterforce capabilities and explicit announcement of a flexible targeting policy would be a more effective deterrent to Soviet limited counterforce strikes under nuclear blackmail scenarios. In his view:

[1] Schlesinger, 1974.

To enhance deterrence we may also want a more efficient hard-target-kill capability than we now possess; both to threaten specialized sets of targets (possibly of concern to allies) with a greater economy of force, and to make it clear to a potential enemy that he cannot proceed with impunity to jeopardize our own system of hard targets.[1]

Schlesinger did not invent the concept of flexible nuclear targeting, for earlier administrations planned as well for a variety of targeting contingencies. What made his 1974 announcement different was the explicit announcement of both a flexible targeting policy and a strategic force acquisition program that included weapon accuracy improvements to enhance options for limited and discriminating employment of nuclear weapons.

2. "Controlled Tactical Counterforce"

Concern about the credibility of extended deterrence, that is, of the standing U.S. threat to retaliate with nuclear weapons if Europe or other areas of U.S. interest were attacked, stirred some strategic thinkers to compose nuclear denial plans emphasizing regional defense. These strategists felt that the threat to physically block any local aggression by nuclear means better deterred limited proxy war sponsored by the Soviets than what seemed to them to be the rather indirect and "blunderbuss" approach of smashing distant Soviet cities in post hoc punishment. Implicit in most of these plans was an estimation

[1] Ibid.

that the United States and its allies could take advantage of the efficiencies of nuclear firepower to offset Communist conventional advantages in most theaters. The question that had to be addressed in any formulation of a limited nuclear counterforce strategy, however, was just how the conflict was supposed to stay limited after nuclear weaponry became the medium of exchange in local military transactions.

Targeting: What? How Much? When? In 1955, Colonel Richard S. Leghorn of the United States Air Force Reserve succinctly stated his targeting policy options in the form of four rules:

1. Punish an aggressor who attacks with conventional surface forces by destroying, with tactical nuclear weapons, his units in the battle zone and immediate rear areas.
2. Punish aggression which is supported with conventionally armed aircraft by hot pursuit in the air and nuclear attack on air bases of the aggressor.
3. Punish nuclear aggression by using our nuclear plenty to destroy instantly and utterly the nuclear stockpiles and the entire delivery capability of the aggressor.
4. Withhold nuclear attacks on aggressor cities unless the aggressor first attacks cities of the U.S. or its allies with weapons of mass effect.[1]

Attacking units would be devastated by nuclear bombs, cannons, and rockets. The counterattack would be limited,

[1] Leghorn, 1955.

depending upon topography, to an area extending 100 miles back from the aggressor's border. Reinforcements to the attacker and logistics would be hit faster than they could be used to replenish destroyed front line units. With this strategy "agriculture, cities and industrial complexes behind the 100 mile communications zone need not be attacked." The timing of strikes would be determined by the rapidity with which U.S. units holding the line could respond to initial aggression; but the speed of even conventional offense would dictate an optimum targeting window not exceeding, say, two weeks in Europe.

Assumptions and Implications. Leghorn acknowledged the Soviets' nuclear "sufficiency"--that is, their ability to destroy a great amount of value to the West. But this state of affairs was compensated for by U.S. possession of "nuclear plenty," giving this country enough weapons to fulfill more than simple countervalue retaliatory needs. Noting that "it took 330 billion dollars in four years of World War II to deliver the two megatons of high-explosives expended by the United States--or roughly 15 billion dollars to deliver 100 kilotons," Leghorn marveled at the fact that the latter figure would now support a "large, modern Air Force, which can deliver many thousands of larger nuclear blasts in a few days." Further, he noted that there was no adequate defense against nuclear air attack whether by bomber or ICBMs, because so few penetrations were required to be devastating.

What this strategist concluded from these "facts of nuclear

life," as he called them, was that the threat of tremendous destruction of cities posited by the "massive retaliation" strategy was not credible and did not take advantage of superior U.S. nuclear assets. Besides, "massive retaliation" was too serious a threat to invoke where lesser countermeasures were called for, as in Indochina. There was no reason to mimic a Soviet city-busting posture if we could thwart local aggression at the source of the crime, Leghorn reasoned. He also worried that exclusive preparation to deliver spasmodic obliteration might eventually make it impossible to fight in a more selective and flexible fashion. Finally, Leghorn believed that "massive retaliation" was counter-productive because it engendered a "climate of fear" that retaliation and counter-retaliation would destroy the world, trading national suicide for revenge, or short of that, shackling the United States to a reconstruction tab never conceived of in history.

To shore up these gaps in the U.S. deterrent, Leghorn believed that tactical nuclear warfighting capabilities would be vastly superior to large conventional forces. The latter option, he thought, played to Soviet strengths and would be immensely expensive to prepare for as well as to execute. In short, he was convinced that reliance on U.S. nuclear counterforce striking power could stop local theatre and strategic attempts to alter the status quo at great advantage to the United States.

If deterrence failed, Leghorn asserted that mobilization would not be as critical as it was in World War II, but rather

the efficiency of forces in being would be chiefly responsible for a favorable outcome. Accordingly, attacking Soviet cities initially after some infraction would have little effect on the adversary's ability to wage war. Assuming intelligence was vastly upgraded to support such an effort, striking such targets as aircraft, missiles, submarines, troops, stores of fuel and nuclear explosives, and the directly supporting supply system in a precise way would cripple decisive targets and spare the "militarily unjustifiable" commission of genocide. In any case, spared cities could be used as hostages later to bring the war to a rapid conclusion. If Soviet nuclear capabilities were blunted successfully, leaving large land armies still intact in Western Europe, Leghorn proposed the following combination of residual threats to terminate the war on terms favorable to the United States.

1. Nuclear bombing of land armies and threats to do so;
2. A threat to pulverize production and cultural centers, after appropriate warnings to the populations to evacuate in keeping with our promise not to bomb population centers unless ours were first attacked;
3. Diplomatic negotiation if the Kremlin proves tractable;
4. In case it does not, a strong propaganda drive to encourage dissident elements to rebellion; and;
5. Airborne military seizure of a few key administrative centers such as Moscow. [1]

[1] Ibid., p. 88.

Leghorn acknowledged that this strategy would only buy time against an adversary quickly achieving strategic parity and that the this threat formulation would be limited after that point. For the not too distant future, this strategist prescribed disarmament as the only way out of the nuclear quandary.

Targeting: What? How Much? When? Although he advocated retaining the countereconomy capabilities of strategic nuclear forces, T. F. Walkowicz, a former Air Force officer and Board member of the Air Force Association, proposed in 1955 that "combat forces, lines of communication and supporting supplies constitute the principal targets for attack and destruction." He suggested the following priority list among enemy offensive targets: (1) nuclear-armed combat aircraft and their supporting installations, (2) massive ground troop concentrations and smaller but vital ground units, (3) submarines and their bases, (4) logistics and communications systems, (5) fuel and ammunition storage near the front, and (6) production facilities as time permits. After receiving tactical warning of an attack, a premium would be placed on rapid and responsive "area" surveillance that could collect data in any weather or terrain and deliver it to a supporting intelligence organization for reduction to a form usable "for immediate strikes." [1]

Assumptions and Implications. This strategy was directed against three objectives: (1) to prevent the United States from being "nickle and dimed" to death by Communist subversion and

[1] Walkowicz, 1955.

local aggression, (2) to provide a choice between the wholesale slaughter of nations by massive retaliation and responses to aggression more in line with the size of the transgression, and (3) to accomplish this at an expenditure level that could avoid huge outlays for conventional forces on top of those required for adequate strategic air power.

Walkowicz assumed that strategic bombing against an enemy's mobilization base after deterrence had failed was counterproductive in the nuclear age, given the massive destruction potentials of forces in being. Further, because the Soviet Union possessed a similar countereconomy capability, threats of retaliation against cities for local aggression were not credible because the Russians could counter-retaliate. Finally, a countereconomy strategy did not take account of the U.S. lead in nuclear weapons stockpiles and flexible aerial delivery systems.

What Walkowicz proposed to do, then, was to deter a massive surprise attack on the United States by maintaining the contemporary long-range nuclear offensive capability. But further, he sought to deter or, if necessary, to win local war "through a capability and a determination to strike decisively with air atomic power at Communist forces of aggression anywhere along the periphery of the Iron and Bamboo curtains." [1]

In the event that deterrence failed, this analyst hoped to exploit the following U.S. resources: (1) an overwhelming intercontinental offensive capability; (2) widely dispersed and

[1] Ibid.

flexible tactical nuclear forces; (3) an effective active and passive air defense system to protect first, the strategic retaliatory forces, and second, the U.S. population and its economic assets; (4) a modern air logistics system capable of supporting air operations globally; and (5) a reconnaissance and intelligence capability geared to the rapid tempo of nuclear counterforce operations worldwide.

Targeting: What? How Much? When? In 1956, Rear Admiral Sir Anthony W. Buzzard (Royal Navy, ret.) suggested "complying with the basic military principle of first concentrating on the enemy's armed forces, as opposed to his people." He proposed to confine the tactical use of nuclear weapons to atomic fission arms and to exclude their use against towns and cities. The strategic use of nuclear weapons would include thermonuclear (hydrogen) bombs against population centers and would be invoked only when essential. Buzzard summed it up this way:

Thus, without committing ourselves unalterably in advance, or showing our hand too clearly, we would have the option, when threatened with a limited aggression too great for our conventional forces to cope with, of saying to the prospective aggressor: 'If you do attack, we will, if necessary, use atomic and perhaps chemical weapons against your armed forces. But we will not, on this issue, use hydrogen or bacteriological weapons at all, unless you do, and we will not use any mass destruction weapons against centers of population, unless you do deliberately.' To this statement we might append certain exceptions, such as cities in the front line of the land fighting and those with airfields alongside.[1]

[1] Buzzard, 1956.

Military targets residing in or near cities and towns could be hit with conventional explosives. Submarine bases would be mined, and key industrial targets and bridges would be attacked with high-explosive guided missiles.

Assumptions and Implications. What spurred Buzzard to offer his "graduated deterrence" was lack of faith in massive retaliation to prevent Communist subversion along the periphery of the free world. He was afraid that pride and miscalculation on the part of "communist menaces" would lead to a local deadlock out of which aggressors might seek to extricate themselves with a nuclear Pearl Harbor. Buzzard was looking for a defense policy that:

While continuing to maintain the deterrent against deliberate world war, can also provide the local tactical strength necessary to negotiate from local strength, to deter limited Communist aggression, and to deal with the local nationalistic quarrels of third parties.[1]

In the event deterrence failed, Buzzard felt that "graduated deterrence" held military, political, economic, and moral advantages over "massive retaliation." Militarily, the strategy would focus the retaliation where it could prevent the most damage (namely, at the enemy's armed forces), would permit limited use of nuclear weapons against key targets without automatically

[1] Ibid., p. 228.

invoking mutual suicide, and could take advantage of the superior U.S. nuclear stockpile. Politically, Buzzard's formulation would remove the bluff from threats to respond to local aggression and would give more latitude for diplomatic negotiation through tactical strength, without reducing the deterrent to all-out attack. Graduated deterrence was more economical than massive retaliation in the long run because with the same forces in being it was more credible against limited attack. Strong tactical land, sea, and air forces would be necessary in any case for deterring and repelling limited aggression. In this context sedulous accrual of tactical nuclear capabilities would provide the most economical policy alternative. Finally, Buzzard thought that his strategy was morally superior to massive retaliation because:

All our fighting should be limited (in weapons, targets, area and time) to the minimum force necessary to deter and repel aggression, prevent any unnecessary extension of the conflict, and permit a return to negotiation at the earliest opportunity--without seeking total victory or unconditional surrender.[1]

Targeting: What? How Much? When? In 1957, Henry Kissinger, writing under the auspices of the Council on Foreign Relations, stated that in the nuclear age a defender simply could not afford to concentrate his local forces on a static front as was done in World War II, because the aggressor would then step up

[1] Ibid., p. 229.

the power of his weapons until he achieved a breakthrough.[2] If the defender relied upon a World War II vintage logistics and communications system, collocated with cities and industrial centers, the fire drawn from such aggression would result in appalling losses to his civilian populations. Instead:

The tactics for limited nuclear war should be based on small, highly mobile, self-contained units, relying largely on air transport even within the combat zone. The units should be small, because with nuclear weapons firepower does not depend on numbers and because a reduction in the size of the target will place an upper limit on the power of the weapons it is profitable to employ against it. The units must be mobile, because when anything that can be detected can be destroyed, the ability to hide by constantly shifting position is an essential means of defense. The units should be self-contained, because the cumbersome supply system of World War II is far too vulnerable to interdiction. The proper analogy to limited nuclear war is not traditional land warfare, but naval strategy, in which self-contained units with great firepower gradually gain the upper hand by destroying their enemy counterparts without physically occupying territory or establishing a frontline.[2]

In sum, the strategy Kissinger proposed called for highly mobile nuclear units to make the countryside untenable to the aggressor, to keep him permanently off balance, unable to concentrate sufficient forces to consolidate territorial gains.

Assumptions and Implications. The need for a limited nuclear war strategy, according to Kissinger, stemmed from the certainty that as weapon destructiveness increased, their use to

[1] Kissinger, 1957, Ch. 6.

[2] Ibid., p. 180.

meet transgression decreased. This makes a deterrent strategy based only upon the massive use of nuclear weapons incredible against smaller scale aggression. Kissinger reasoned that "deterrence is brought about not only by a physical but also by a psychological relationship; deterrence is greatest when military strength is coupled with the willingness to employ it." Thus what was needed to make deterrence credible was a capability to deter aggression with weapons that do not, by their scope, paralyze the will to use them.

Kissinger acknowledged that limited nuclear war was a deterrent because it threatened to inflict losses or to pose risks for the enemy out of proportion to the objectives under dispute. The purpose was to affect the opponent's will in relation to specific goals, not to crush him as one would stop an aggressor bent on global domination. Kissinger saw an added bonus in the cultivation of limited war capabilities in that it provided a sorely needed supplement to a wider-ranging American ability to prostrate an opponent if general nuclear war did break out.

If deterrence failed, there would be no guarantees that escalation to total war would not occur, but Kissinger maintained that there would be "built-in" factors favoring limitation of nuclear conflict. The first of these was inherent in the concept of "limited war" itself. Contrary to total war, "a limited war . . . is fought for specific political objectives which, by their very existence, tend to establish a relationship between the

force employed and the goal to be attained." The practical problem, then, "is to apply graduated amounts of destruction for limited objectives and also to permit the necessary breathing spaces for political contacts." Under Kissinger's hypothesized optimal tactics, urban centers would no longer serve as key elements in the logistics and communications systems of the military forces. Thus, "the risks of initiating city bombing may outweigh the gains which can be achieved." But in the end, assuming that both sides are truly intent upon avoiding all-out war, "as long as both sides retain a retaliatory force capable of devastating the opponent, they will not look for an excuse to expand the war; rather, they will have a powerful incentive to work out some set of limitations, however tenuous its logic." [1]

[1] Ibid, p. 187.

IV. COMPELLENCE

Compellence differs from deterrence, according to Thomas Schelling, in that the former tries to coerce an adversary to move in a way beneficial to us, while the latter attempts to prevent him from moving in ways inimical to our interests.[1] Compelling positive behavior in an opponent requires the threat of initial action on our part, while deterring attack requires only the threat of a credible response to an enemy's provocation. As Schelling put it:

The threat that compels rather than deters often requires that the punishment be administered until the other acts, rather than if he acts. This means, though, that the action initiated has to be tolerable over whatever period of time is required for the pressure to work on the other side. For deterrence, the trip-wire can threaten to blow things up out of all proportion to what is being protected, because if the threat works the thing never goes off. But to hold a large bomb and threaten to throw it unless somebody moves cannot work so well; the threat is not believable until the bomb is actually thrown and by then the damage is done.[2]

The concepts of compellence and deterrence usually overlap in operation. One nation can attempt to compel another toward some action by firing out of the blue, threatening to continue unless the desired response is forthcoming, but in the nuclear age, under conditions of essential strategic equivalence and mutually assured destruction, the probability of compellence being initiated in this way is remote. More likely, the compellent interaction will be locked within, and come about as a

[1] Schelling, 1966.

[2] Ibid., p. 70.

result of, an ongoing conflict. This situation could obtain in the course of limited strategic retaliation, a concept addressed above.

Targeting: What? How Much? When?

Targets for limited strategic war include civilian and military assets selected to impress on the adversary an appreciation of U.S. intentions, resolve, capabilities, and modes of reaction. However, given possession of nuclear weapons by both sides, civil damage might be more appropriate for compellence than the destruction of military assets. This would be the case because the emotions stirred in a city attack increase the chances of escalatory counter-reprisals and thence conflagration--a cost an adversary may not wish to incur at the expense of standing pat on a limited issue. By this logic, then, once territory has been lost to an aggressor, it may be possible to conduct a series of reprisals that not only motivates reconsideration of further aggression but coupled to declarations seeking remedy may be able to force a retreat to the status quo ante as well. The timing of attack corresponds to the object of the lesson to be taught and the action we wish to compel.[1]

Assumptions and Implications

The purpose of any limited strategic action is to create expectations in the minds of adversaries about how we will

[1] On this, see Knorr and Read (eds.), 1962.

behave. It is a teaching process conducted through successive challenges. Theater and homeland damage matter, but not so much for themselves as for how convincing they are in communicating our resolve to persist until we obtain our objective. The central notion is that nuclear damage and the fear of more raises the risk of escalation and provides an element of Russian roulette that might be harnessed to advantage in a war of nerves.

If a nation elects to enforce its will through nuclear compellence, such actions must not be premised upon expectations that strategies and situations are

Predictable, artificially pure and simple, could be relied upon to go off as expected, and recognizable at the time for what they were--without the fog of war; the passions and the uncertainties; the snafus, misunderstandings, missed cues, and compromises; and the inevitable lack of any detailed plan for the actual situation that arises.[1]

Further, a nation's leadership should not be seduced into thinking that war conducted by limited increments will be more rational or less impetuous than that conducted in a flurry. Good sense can be lacking at a deliberate pace as well as in a more panicked environment.

[1] Schelling, "Comment," in Knorr and Read (eds.), 1962.

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