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Dr Donald M Snow
MORE FOR LESS-AN ARMS CONTROL STRATEGY FOR THE 1990s
Col Randall E Wooten
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A SIOP FOR PERESTROIKA
Richzrd Szafranski, Col
THEATER NUCLEAR FORCES AND EXTENDED DETERRENCE IN A MULTIPOLAR WORLD
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by

Dr Donald M. Snow

More for Less—An Arms Control Strategy for the 1990s

by

Col Randall E. Wooten
and
Col Eric E. Sundberg

A SIOP for *Perestroika*?

by

Col Richard Szafranski

Theater Nuclear Forces and Extended Deterrence in a Multipolar World

by

Maj David L. Booker

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This publication has been reviewed by security and policy review authorities and is cleared for public release.

Contents

Foreword

The stunning changes in the complexion of international politics that began late in the decade of the 1980s and continue today will profoundly affect the American military establishment as a whole, and the US Air Force in particular. Decisions about the future course of the military will be made in the early part of the 1990s which will essentially determine the course of the US Air Force well into the next century. Decisions of such importance require thoughtful consideration of all points of view.

This report is one in a special series of CADRE Papers which address many of the issues that decision makers must consider when undertaking such momentous decisions. The list of subjects addressed in this special series is by no means exhaustive, and the treatment of each subject is certainly not definitive. However, the Papers do treat topics of considerable importance to the future of the US Air Force, treat them with care and originality, and provide valuable insights.

We believe this special series of CADRE Papers can be of considerable value to policymakers at all levels as they plan for the US Air Force and its role in the so-called postcontainment environment.

DENNIS M. DREW, Col, USAF
Director
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Executive Summaries

ESSAY 1. "The Functions and Structure of Nuclear Deterrence in the Post-Cold War World"

The change reshaping the Soviet Union and other former members of the Communist bloc has also altered the strategic equation for the United States. Given that nuclear weapons and the intense superpower rivalry of 40 years of cold war have helped foster a certain air of predictability in international affairs, the present flux in the international system has created a number of possible security scenarios. The author explores these possibilities as they relate to the strategic future of the Soviet Union, the possible evolution of a new European system of collective security, and the challenges of regional conflict in a multipolar world. Of primary concern is the question of the continued validity of traditional concepts of deterrence in a system characterized by the profusion of advanced military capabilities which no longer possesses many of the stabilizing strategic counterweights of the cold war.

ESSAY 2. "More for Less—An Arms Control Strategy for the 1990s"

Strategic nuclear force structure requirements for the 1990s must be considered in light of the changing security environment, and particularly in terms of the Strategic Arms Reduction Talks (START). Because START will shape the relative strategic capabilities of the US and Soviet Union for the foreseeable future, it is imperative that the US devise the most cost-effective nuclear deterrent force possible within expected START constraints. The authors examine a number of force structure alternatives as to triad size and composition (or tetrad, if cruise missiles are considered) to determine how we might obtain the best possible deterrent guarantee for the best price under START limitations.

ESSAY 3. "A SIOP for *Perestroika*"

The evolving strategic relationship between the US and the Soviet Union appears to offer an unprecedented opportunity for both nations to develop nuclear weapons development and deployment policies based on a shared security commitment to deterrent stability and risk reduction, rather than on the latent insecurities that characterized cold war defense policy. Given that the United States has apparently arrived at a culminating point in its competition with the Soviet Union, a new deterrent construct is urgently required if we are to realize the gains possible in current global events.

ESSAY 4. "Theater Nuclear Forces and Extended Deterrence in a Multipolar World"

The role played by nonstrategic nuclear forces in the cold war logic of extended deterrence is changing dramatically, as the US and Soviet Union retreat from the quasi confrontational military postures of the past 40 years. What do present changes in the global security picture portend for this class of weapons? The author evaluates possibilities using a matrix of considerations: trends in the international system; strategic ways, means, and perceptions; intrinsic capabilities of new generations of nuclear weapons; and operative views of extended nuclear deterrence. One conclusion is that, owing to the desirability of having a graduated means of deterring conflict and controlling escalation, theater nuclear weapons may remain important elements of US military capability in the global environment of the future.

Preface

No single thing abides, but all things flow
Fragment to fragment clings; the things thus grow
Until we know and name them. By degrees
They melt, and are no more the things we know.

--Lucretius, "On the Nature of Things"
The Story of Philosophy

Dramatic changes in the geopolitical landscape have proceeded with scarcely diminished vigor since the late 1980s, and show few signs of abating. In many respects, we can only begin to guess at the ultimate direction of these changes, much less their ultimate destination. Consequently, it is not surprising to find few, inside or outside the defense community, willing to venture a reflective analysis of the long-term implications of these changes for American security strategy. For, to quote Mark Twain, in view of the relative probability of being proven embarrassingly wrong by subsequent events, it would seem "better to remain silent and be thought a fool, than to open your mouth and remove all doubt."

As is typical of human affairs in general, significant contradiction as well as uncertainty characterize the current flux in the international system. The possibility of more rather than less conflict at the regional level diminishes the promise of a world free from the tensions of perennial superpower competition. As the Bush administration recently noted, "the erosion of U.S.-Soviet bipolarity could permit and in some ways encourage the growth" of the threat to US security interests posed by regional conflicts throughout the world. Similarly, for a world long accustomed, but never reconciled, to the nightmare possibilities represented by nuclear weapons, recent developments in Soviet-American relations portend at least partial relief from what Albert Wohlstetter termed the "delicate balance of terror." Yet nuclear weapons production continues, new and improved warheads and delivery systems are developed and deployed, existing strategic and theater nuclear weapons remain in operational readiness, and the proliferation of technologies of mass destruction proceeds apace. The logic of such developments is as yet uncertain, while their grammar defies interpretation.

It is with one foot firmly planted in such realities that this collection of thoughts on the nuclear future is offered. This collection does not presume to be comprehensive in terms of exploring all issues of critical importance to the question of future nuclear ends and means. For example, discussions of the future implications of strategic defense or of advanced nuclear weapons technologies are notable for their absence. The omission of such issues here is not a judgment as to their relative importance as pieces in the unfolding strategic puzzle but rather the result of a conscious decision to begin with things as we know them. By examining first those dimensions of the nuclear equation most fundamental

to the immediate security interests of the United States, such as the nature of the evolving strategic relationship between the United States and the Soviet Union as well as arms control options for lasting strategic stability, the essays here will, hopefully, provide a baseline for considering the shape of things to come. Neither do any of the contributions make an unqualified conceptual leap into the unknown by attempting to predict the future or proposing revolutionary solutions to the problems of a nuclear world. The approach settled upon as potentially most useful to those charged with policy development was to project—and, where appropriate, prescribe—future nuclear weapons developments rather than to speculate as to what might be. This is not so much a matter of hedging one's bets as it is a tacit concession that the immediate future is an evolutionary extension of the present rather than a dramatic departure from the recent past.

The hope of the contributors and the editorial staff is that an examination of what we know about the attributes of nuclear weapons and how they relate to national power in this last decade of the twentieth century will, in a general sense, produce useful insights, if not answers, as to where we may (or should) be going. If the essays raise more questions than they answer, as long as such questions are ones that might not have arisen of their own accord, this effort will have accomplished its purpose.

At the risk of burdening the reader with unwanted debts, several acknowledgments must be made to those responsible for this project. First, to Col Dennis M. Drew, director of the Airpower Research Institute, who commissioned the Air Force Futures Project of which this is but a small part, and who, in inimitable fashion, allowed the contributors to "do their own thing" with no intellectual constraints as to the scope of the ideas to be considered. Second, to Drs David MacIsaac, director of research, and Lewis Ware, senior research fellow, whose scholarly insights helped to expose hidden flaws in both theme and development of the ideas on theater nuclear forces. Third, to Dr Richard Bailey, editor and professional historian, whose perspectives as to the scope of the historical change engulfing the world are matched only by his ability to make the words speak as the authors intended. Fourth, to Dot McCluskie and her production staff in the Air University Press for their unstinting efforts to make this project a published reality, and finally, to the essayists themselves, who bore with good humor the inevitable slings and barbs of the editorial process.

Essay 1

The Functions and Structure of Nuclear Deterrence in the Post–Cold War World

by

Dr Donald M. Snow

Introduction

THE ABRUPT collapse of the Soviet empire and the cold war has changed almost everything about international relations and national security. The nuclear balance and the structure of nuclear deterrence are no exception to that rule. In the turbulent year since the Berlin Wall fell and brought down much of the Communist world with it, the nuclear balance has remained. The question that must be asked for the future is: What will the structure and functions of nuclear weapons and the balance be in the evolving world order?

In early 1991, two factors stand out as parameters within which considerations of nuclear weapons must be enclosed. One is that we are in the midst of a major systemic change in the nature and rules of international relations. The last time such a change occurred was at the end of World War II, when the victorious Allies—principally the United States and the Soviet Union—were faced with rebuilding the shattered peace.

There were two major variables that would shape the post–World War II world. The first was whether the wartime collaboration could be maintained. If it could, the United Nations provided a collaborative forum for collective security through Article VII of the charter; if it could not, then Article 51 of that same charter provided for organizing their discord (the collective defense provision). In the absence of collaboration—at least before Operation Desert Shield in 1990—the system evolved to the politico-military confrontation known as a cold war.

The other variable was the advent of nuclear weapons. When World War II ended, of course, the United States was the sole possessor of these "absolute weapons," but everyone knew it was only a matter of time until the Soviets gained them as well. The question then became: What will be the role of nuclear weapons? Would their purpose be deterrence, as Bernard Brodie argued in *The Absolute Weapon* in 1946?[1] Or would their role be as yet another, if awful, weapon of war, as William Liscum Borden suggested during the same year in *There Will Be No Time?*[2]

The point is that it took several years to answer both questions. Postwar collaboration was effectively dead by 1947, but it took several more years for the edifice of the cold war to be completely erected. Similarly, the debate over nuclear weapons was hardly short term.

The collapse of the cold war was an event as traumatic as the end of World War II, and the result has been to begin a process of system change likely as profound. To take the parallel a step further, we are at a point more or less comparable to where the framers of the postwar system were in 1946 or 1947. There are a lot of questions about the future, but not many answers about its "shape."[3]

In one sense, the questions are very similar. The most basic question is the continuing relationship between the cold war superpowers. While growing cooperation between the United States and the Soviet Union has been the most positive sign of the new postwar order, the enormous turbulence and unrest in the Soviet Union creates at least some question about the final outcome and thus the nature of the security question in the post–cold war system. A related question raised by Soviet turbulence and enlivened by the dynamics of the international

economic system is who will be the major players in the new system.

The nuclear question also remains. As will be argued below, the cold war system answered the 1946 question about nuclear utility in Brodie's favor, and deterrence remains a key element both in system transformation and maintenance in the new order. The new questions about nuclear weapons have to do with stability in the Soviet Union and the proliferation of nuclear and other lethal weapons to the third world.

The other relevant factor affecting nuclear dynamics is the existence of the nuclear balance itself at very high levels of destructive capability. In 1946 deterrence was a matter of simple American self-restraint in using the weapons available to it; today, even after the so-called deep cuts in the Strategic Arms Reduction Talks (START) are absorbed, the deadly balance is not materially affected. The rubble may bounce a few times less often and possibly not quite as high, but there is no doubt whatsoever that it still will bounce.

Just as the outcome of Soviet-American relations in the new order is at least partially problematical, so is the role of nuclear weapons and the nuclear balance. The two are related: if Soviet-American comity becomes the underpinning of the new order, then nuclear weapons, at least as superpower deterrents, will gradually lose their meaning in that context. On the other hand, should convulsions in the Soviet Union badly destabilize that country and possibly bring into power a regime that sours the growing friendship, as Eduard Shevardnadze warned in December 1990 when he resigned the foreign ministership, then nuclear weapons could take on quite a different role.

The task we have before us is to try to assess what the future will bring to the nuclear relationship between the United States and the Soviet Union. To do so, we will begin by looking at what that relationship has become and how that relationship helped contribute to the current system change. Following that discussion, we will look at some of the variables that will act and interact to create the shape and rules of the new system. Finally, we will try to make some recommendations, albeit hesitantly, about the role of nuclear weapons during and after the transition.

The Nuclear Status Quo

NUCLEAR WEAPONS have always been controversial. Given the consequences of their use in anger where more than one disputant possesses them, this is entirely understandable. Because nuclear weapons and what they do are anything but attractive, people by and large are repelled by them. They do not want to think about nuclear weapons; they wish that nuclear weapons would simply go away.

While understandable, such a reaction taints thinking about nuclear weapons and their role in world politics. While admitting that one would hardly want to cuddle up with a nuclear bomb-shaped plush pillow, that emotion does not relieve us of understanding why the nuclear balance came about in the first place and, more importantly, how it has contributed to the remarkable series of events that is transforming the international system.

This is not the place for a history of the nuclear arms race. The fact that there evolved a competition in nuclear arms as the centerpiece of the postwar international system probably has two roots. The first and most obvious root was that the beginning of the cold war and the arrival of nuclear technology coincided.[4] Thanks to the ceaseless activity of the nuclear physics community during the war, nuclear fission had been conquered

by the Americans; and by dint of hard work and successful espionage, the Soviets were not far behind.

The second reason for the development of nuclear arsenals was that there was a military competition between the superpowers that was the outgrowth of the negative verdict on postwar collaboration. Since nuclear weapons were the most awesome weapons in human history, neither side could allow the other to gain superiority in this weaponry, particularly during the darkest days of the cold war (the 1950s and the early 1960s), when most people felt war was inevitable. Cheap Freudian analogies notwithstanding, nuclear arsenals became the pinnacle of the competition. What separated the superpowers from everyone else was not only that they possessed these weapons, but that they possessed them in enormous numbers. Nuclear weapons were applied not only to the strategic mission of attacking or retaliating against one another's territory, but to the front in central Europe and by extension virtually everywhere else.

Nuclear arsenals, more or less mindlessly, grew and grew. As technological possibility produced first ballistic missile delivery capability to launch for new thermonuclear weapons from land or sea and then the ability to put several warheads on each missile, the arsenals grew. The very serious people who oversaw and justified this growth from a few dozen warheads in the latter 1940s to over 12,000 apiece aimed at one another's homeland by the 1980s did not think this was a funny thing at all, of course.[5] They saw growing threats and the need to compete, lest one side or the other delude itself into believing it had gained some usable, exploitable advantage. Serious stuff indeed!

The funny thing that happened along the way is this: nuclear arsenals became so huge and so deadly that they became utterly useless. Despite elaborate and utterly factless—thus vacuous—debates about the levels at which nuclear war might be fought (could it be limited? if so, at what levels?), no one has ever had the slightest idea whether nuclear war could be limited or not. What came to be recognized was that, despite all the plans and the unrealistic war games in the world, a nuclear war once started *could become an all-out war*. Robert Jervis termed this grim probability as "assured destruction as fact," which is as good a term as any.[6] Since an all-out nuclear exchange between the superpowers would be so utterly devastating—precisely how devastating is largely beside the point—that no one could possibly think they had "won" anything for the effort, the avoidance of such a war became the cardinal value.

The result is something I have elsewhere called *necessary peace*—a structure of peace born not out of any sense of goodwill toward one another by the superpowers but from the fear of the consequences of the potential all-out version of such a war.[7] As a result, the structure of deterrence is really one of self-deterrence, where the superpowers are deterred not by shrill, idiotic threats from the other but by the fear that their own societies would be devastated in any such conflict.

What is interesting about this is that the political leaders in both countries appear to have been out ahead of the analysts, if that surprises anyone. American leaders at least as far back as Dwight D. Eisenhower have articulated the need to avoid nuclear war, and it has been among the first pronouncements of every Soviet leader from Nikita Khrushchev forward that nuclear war must be avoided at all costs.

The result has been an increasingly stable structure of deterrence across time. Those who have denied this fact have had to appeal to the visceral fears we all have of nuclear weapons or to build horror scenarios that offend the credulity

of any thinking person. The conclusion is inescapable: nuclear war has not been avoided because of the cleverness or good luck of man; it has, more simply, been the result of avoiding the single most stupid act of human history.

What has taken a little longer to figure out has been how a stable nuclear balance has contributed to peace more generally. In the early 1960s, the Cuban missile crisis made American and Soviet leaders who had previously believed they shared essentially no interest realize that indeed they had some mutual interest in avoiding mutual incineration. The result was a series of arms control agreements that regularized overall relations and played at the edges of the overall arsenals. As the glow of détente faded before the Jimmy Carter human rights campaign, Afghanistan, and Ronald Reagan's depiction of the "evil empire," this salutory relationship became obscure.

It was up to Mikhail S. Gorbachev to take us the next step forward. Partly motivated by mounting economic problems but also mindful of the consequences of nuclear war (made more poignant by the consequences of the Chernobyl nuclear accident), Gorbachev recognized—as many Americans had also known, in their heart of hearts—that since any conflict between the superpowers and their blocs was potentially a nuclear war, it was also unallowable. For Gorbachev, this was all the more obvious because even a conventional war might involve advertent or inadvertent attacks on nuclear power plants, thereby creating a de facto nuclear war.

From this recognition, the hollowness of the entire cold war structure of confrontations centered in Europe was an easy next step. In a world where both sides were restrained by their own sense of fear of escalation, the rest was ritual. That was all right when all the ritualistic behavior cost was money in no short supply; when the dollars and rubles started to run short, the charade became too costly to play out.

It is in this sense that nuclear balance played into the collapse of the cold war, indeed was one of the principal causes when combined with the economic collapse of the Soviet Union. The two factors must be seen in combination. Economically, the Leonid Brezhnev years had been the "era of stagnation," where the Soviet economy flattened out while Western economies expanded dramatically. The most obvious point of distinction between East and West was in the area of high technology (e.g., computers, telecommunications, and derivative technologies); the Soviets were falling rapidly behind in this driver of economic preeminence. Moreover, they were being deprived of access to Western technology on national security grounds; the West would not share "dual use" technologies with a military adversary.

In these circumstances, ending the cold war doubly made sense. On the one hand, the terribly expensive competition had become devoid of meaning; there was little to be gained from continuing it. On the other hand, the Soviets needed Western assistance at all levels—as the winter of 1990–91 provided dramatic testimony—that was not going to be forthcoming as long as the cold war raged.

What thus emerges from the nuclear past is a very stable nuclear status quo that has contributed to peace and change. As Igor Sergeev, head of the Soviet Strategic Rocket Forces, puts it, "It is precisely nuclear parity, the existence of nuclear weapons on both sides, that has preserved the peace. In my opinion, it is the guarantor of the impossibility of a world war, and it can even play a pacifying role in regional conflicts."[8] Before one moves to a very different nuclear future, one needs to be certain that this utility is not sacrificed for some other purpose.

Nuclear Weapons in a Post-Cold War Environment

IF NUCLEAR weapons have been helpful in moderating conflict in the past, do they retain utility in the future? It is almost certain that the continuing breakup of the cold war will place pressures on both the Soviet and American governments either to reduce dramatically or eliminate altogether their nuclear arsenals as, for instance, is called for in the Nuclear Nonproliferation Treaty of 1970.

In the post-cold war system, there are at least two variable conditions which could affect and be affected by the nuclear balance. The first and most obvious problem is the evolution of the old cold war "battle grounds." The process of change is clearly not likely to taper off in the Soviet Union, and the rest of the continent of Europe will undergo adjustment as well. At the same time, the other great system dynamic is the reemergence of the third world as a problem area, specifically in the guise of so-called regional powers heavily armed with very lethal, sophisticated arsenals.

Of these, the situation in the Soviet Union is clearly the most pressing, if for no other reason than that the Soviets remain the only country on earth capable of destroying the United States with nuclear weapons. The presumed intent to do so may have largely disappeared in the Gorbachev era, but no one is currently willing to speculate either how long that era will last or what will succeed it.

What happens in the Soviet Union is critical to the new international order and hence to the nuclear balance that is part of that order. The Gorbachev reform program, aimed at remaking his country a normal rather than rogue member of the international order, is torn from three sides. First, political reform moving toward democratization has become the vehicle for expressing a growing list of demands against the system and its leaders. Second, economic *perestroika* has not produced the vibrancy in the economic system on which political legitimacy must reside. Rather, the movement toward the free market from the command economy—an economic odyssey of historically unprecedented scope for which no one has a real road map—has seen things get worse. Third, democracy has allowed the conquered minorities of the empire to express, in increasingly strident terms, their discontent and their desires for national self-determination.

Where will it end? No one knows, and the guesses change on an almost daily basis. Fears of a military coup and reimposition of a Stalinist dictatorship swirl with horror projections of separatists seizing and using or threatening to use nuclear weapons against the Soviet center. No one predicts a rapid or smooth settling down of problems. Almost everyone assumes the Soviet Union will emerge a reduced place—in power and probably in physical size.

In the storm of change, nuclear weapons act as something of an anchor. Assuming that the START agreement will leave each side with an effective arsenal of around 8,000–9,000 weapons (including those outside the counting rules), the capabilities that both sides have will continue to sober any downturns in relationship; nuclear arsenals will continue to "clarify the mind," to borrow an old Southern cliché.

The bilateral role of nuclear weapons in the future will depend on the direction of change and reform in the Soviet Union. What change has done up to now is largely to remove any presumption of hostile Soviet intent from the relationship; they maintain the weapons, but few believe they have any desire to use them against us.

If change occurs positively—greater democratization, economic prosperity within the framework of market

economics, some acceptable outcome of the minorities question—the bilateral importance of the nuclear relationship should decrease. The positive image of change, after all, has the Soviets becoming increasingly Western, and it is a simple fact of life that political democracies do not make war on one another; people rarely choose war to solve their problems when given the choice.

If this is the case, we will enter a nuclear relationship where huge arsenals would be aimed at one another for absolutely no purpose, and the anachronism of the deadly balance would gradually make sustaining the balance more and more untenable. This, of course, is the same dynamic that now infects the North Atlantic Treaty Organization (NATO); if the Soviets continue to normalize, and with the Warsaw Pact defunct, it will be harder and harder to make a case for keeping NATO around. What happens to NATO may be a good indicator of what will happen to the nuclear balance.

The danger, of course, is that reform will fail and that the Soviets will revert to authoritarianism. Even in December 1990, one could see some signs: Soviet citizens, for instance, carrying placards with Stalin's picture on them. Attachment to democracy and the market are not deep in the Soviet Union, and if democracy and privation come to be equated, the temptation could arise to strike the kind of Faustian bargain that Germany struck in 1933.

The nuclear balance in such a case takes on a different importance. Almost no one believes that the Soviet Union under the worst of circumstances can return as an opponent of the magnitude it was during the cold war; the East European empire is gone and cannot be restored, and the economic conditions that would fuel reversion would mean the Soviet Union is no longer (if it ever was) an economic power.

The worst outcome is a diminished, sulking Soviet Union looking in at the general prosperity from the outside and increasingly resentful of the comparison. Such a Soviet Union, especially if it is ruled again as a dictatorship, is hardly likely to support the new order or to have much of a stake in seeing peace and stability.

Nuclear weapons are very important to such a Soviet Union, because they may be the last bit of evidence for its continued great power status. For such a state, the nuclear balance cannot be irrelevant, because to make it so is to make the Soviet Union irrelevant. Such a Soviet Union may need to be deterred in the old way.

The map of Europe will have something to do with the nuclear evolution as well. Exactly what that contribution is likely to be hinges on two factors. The first is the security "architecture" that the Continent adopts to replace the opposing alliances of the cold war. The second has to do with the place of the new German Republic within the security scheme that emerges.

It would appear that there are three possible forms that a new European security scheme could take on. The first is a structure of which NATO is the base, and membership is extended to the former Warsaw Pact countries, including the Soviet Union if Soviet normalization continues. The advantages of such a system are that the structure exists and that it keeps both superpowers within the umbrella. Its major disadvantage is that NATO, at heart, is a military alliance, and such organizations require an enemy, which NATO currently lacks. Also, NATO has been notoriously ineffective in dealing with non-European—so-called out of area—contingencies due to the diversity of European national interests that come to play in the third world.

The second possible architecture shapes the system around an expanded European Community (EC). The major advantage of such an arrangement would

be that it would be part of a very politically unified Europe. The disadvantages are that the US and USSR are not and cannot be members without critically upsetting the economic mechanism, and that the new democracies of Eastern Europe will not likely be absorbed into the EC for the next decade or so, when they have had time to demonstrate their membership bona fides—commitment to political democracy and stable market economies.

The third possibility is organization around the Conference on Security and Cooperation in Europe (CSCE). This organization came into great public prominence during the November 1990 Paris Summit. Its great advantage is that it includes everyone on the Continent: the 22 former members of NATO and the Warsaw Pact (including one Germany), and the 12 major neutrals (although one may argue that there is not much to be neutral from in the new Europe). The major drawback is that CSCE is not, at least yet, an organization at all, but rather a series of meetings. It lacks structure and organization, although one outcome of the Paris Summit was to authorize formation of a small headquarters and staff.

The European security outcome affects the nuclear balance in two ways. If an inclusive organization—expanded NATO, CSCE, or an expanded NATO evolving to CSCE—comes into being, the nuclear arsenals of all major nuclear powers except the People's Republic of China will be under the same umbrella. This should stifle any pressure for further European nuclear proliferation, especially, in the worst case, to Germany. Moreover, if the United States and the Soviet Union are part of the same security arrangement, this should accelerate the complete hollowing of what is left of the nuclear "confrontation" between them.

Two things could complicate this scenario. One would be the exclusion of both the United States and the Soviet Union by adoption of an EC-based system. While this outcome probably has the least support in Europe because most Europeans want a continuing US presence, it is possible and would raise the spectre of a three-sided competition in which Europeans, including Germans, might conclude that the British and French nuclear forces were inadequate to deter or compete with the Americans and Soviets. The other problem would occur if the Soviet Union continues to deteriorate to the point that it either excludes itself or is excluded because of noxious policies (e.g., repression of minorities). In that case, there is some danger of a renewed East-West competition, albeit one in which the Soviets would be disadvantaged by their absence of allies.

The third problematical aspect of the evolving balance is that of regional conflicts involving emerging regional actors armed with chemical and possibly biological—and in the future nuclear—weapons delivered by ballistic missiles. Saddam Hussein and Iraq are the caricature of this problem, but it could appear elsewhere as well.

The problem is both old and new. Regional conflicts between third-world countries with often long-standing animosities are certainly nothing novel. The European colonial system put a damper on some of this activity for a century or more (in ways not dissimilar to Soviet suppression of nationalistically based animosities in Eastern Europe after World War II). Similarly, these conflicts have boiled over periodically into violence, witness the series of Arab-Israeli and Indo-Pakistani wars since 1948. At the same time, the fear of nuclear proliferation has been around since at least the early 1960s. So, what is new?

There are at least two significant differences today. In the cold war period, regional conflicts became extensions of the cold war competition. This was

regrettable in some ways; cold war issues were usually irrelevant to the base causes of regional conflicts--Indo-Pakistani animosity ha nothing to do with communism and anticommunism, for instance. At the same time, the East and West fell over themselves arming the adversaries, thereby upping the lethal ante where motives made the competition quite deadly enough without outside help.

The good side of all this, however, was that the cold war competition also dampened and restrained regional conflicts. The motivation of both superpowers was, after all, to maximize their influence but also to minimize the likelihood that a regional conflict could swirl out of control, thus potentially dragging the superpowers into direct conflict.

At least in the interim between the cold war system and its successor, that restraint is missing. Both superpowers, but especially the Soviets, have withdrawn from much of their activity in the third world, and their influence has plummeted accordingly. For instance, it can be strongly argued that Saddam Hussein would not have invaded Kuwait in August 1990 nor threatened to attack Israel in the event of war in December 1990 had Soviet cold war influence in Iraq been intact. The new order may devise similar restraints; in the interim, they are missing.

The second difference is that these newly independent regional actors are armed to the teeth. Partly, this is because of the generosity of cold war superpower armament policies augmented by their leaving behind substantial used parts depots in places such as Vietnam, Afghanistan, and Cuba. At the same time, the withdrawal of the superpowers from the armaments business has hardly left a significant void in the arms sales business. Not only are there other first-world public and private sources, a growing number of third-world states are also entering the business of supplying sophisticated weaponry (including chemical agents) and delivery systems (including ballistic missiles) if the price is right.[9] If all this is not bad enough, the danger of nuclear weapons proliferation continues to rear its ugly head into third-world scenarios.

This raises a significant problem for the future organization of the international order. Bilateral superpower nuclear deterrence may be a dying priority and area of concern, but deterrence in the more generic sense clearly is not. "Poor man's nuclear weapons," as chemical weapons are often called, are out there, and with ballistic delivery means available, they cannot be intercepted. While in many cases chemical agents do not present the indiscriminate *mass carnage of nuclear attack*, the results can be gruesome enough against unprotected populations.

What we may be witnessing is the extrapolation of the assured destruction problem to the third world. Especially in the Middle East, national populations tend to be small and concentrated in a relatively few towns and cities. Against such populations the threat of large-scale chemical attacks ballistically delivered could represent an admittedly diluted analogue of "assured destruction as fact" in the superpower bilateral context.

The question, hardly yet raised to this observer's knowledge, is whether the logic and structure of nuclear deterrence as it has evolved over 40 years of Soviet-American interaction can be extrapolated to the third-world situation. In the past, there is very little evidence that super-

power threats did much to deter a lot of third-world violence—especially when that violence was internal. The game is, however, different now. With the new capabilities in the third world and the absence of the kinds of restraint that were available during the cold war, there needs to evolve a new set of restraints to keep third-world countries from attacking one another with weapons of mass destruction. As technologies evolve, this restraint may have to be extended to third-world attacks against the major powers of the Northern Hemisphere.

Conclusion

Hedging the Future

AS THE DISCUSSION has attempted to suggest, we are in the midst of unsettled and unsettling times. The nuclear competition that was the hallmark of the cold war international system may be coming to an end, but that is both good and bad news. The good news, of course, is that the shriveling of the nuclear competition is a symptom of the general ending of US-Soviet military confrontation. The bad news is that the system which replaces the cold war structure cannot outdo the cold war's record for number of nuclear wars. At best it can match that record. It could do worse.

We are clearly in a period of transition from one system to another, where the end result is not at all clear. As argued, there are at least three sources of major uncertainty with implications for the eventual contribution of nuclear weapons and deterrence to the new system. The outcome of Soviet reform and the viability of the Soviet state that emerges from its tumultuous process will clearly be a very basic building block of the new system, as will the shape and form of the European security system that succeeds the cold war division. Finally, the end of the cold war has both coincided with and contributed to the emergence of third-world regional conflicts as a major, possibly the major, security irritant to the new order.

Because these dynamics are in transition, one can only argue for caution in the present. Nuclear weapons played a valuable stabilizing role for the old system, and they may for the new system as well. In the general euphoria of the revolutions of 1989 and beyond, those who have always misunderstood and thus mistrusted nuclear dynamics see their opening to dismantle the nuclear balance. When the shape of the new international system is a great deal clearer than it is today, we may see that it is possible to take that structure down. In the meantime, we are probably best hedging our bets and thus ensuring that the baby does not get thrown out with the bathwater. For now, the nuclear balance still acts as a "clarifying" influence in uncertain times.

Notes

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3. See Donald M. Snow, *The Shape of the Future: The Post-1989 World* (Armonk, N.Y.: M. E. Sharpe Publishers, 1991).

4. For a summary, see Ronald W. Clark, *The Greatest Power on Earth: The International Race for Nuclear Supremacy* (New York: Harper and Row, 1980).

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6. Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1984).

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9. See, for instance, Jo L. Husbands, "A Buyer's Market for Arms," *Bulletin of the Atomic Scientists* 46, no. 4 (May 1990): 14–19; Michael T. Klare, "Wars in the 1990s: Growing Firepower in the Thir[illegible] World," *Bulletin of the Atomic Scientists* 46, no. 4 (May 1990): 9–13; Harvey J. McGeorge, "Bugs, Gas, and Missiles," *Defense and Foreign Affairs* 17, nos. 5–6 (May–June 1990): 14–19; and Thomas L. McNaugher, "Ballistic Missiles and Chemical Weapons: The Legacy of the Iran-Iraq War," *International Security* 15, no. 2 (Fall 1990): 5–34.

Essay 2

More for Less—An Arms Control Strategy for the 1990s

by

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Introduction

THE POLITICAL realities of the past 40 years in Eastern Europe and the Soviet Union have changed with the leaves of fall in 1990. And like those leaves, the monolithic "evil empire" of the Soviet Communist party appears to have fallen and crumbled to dust, leaving fertile ground for peace and prosperity and a new international order. The perception that we "won the cold war," as manifest by the changes in Eastern Europe and the Soviet Union, has led for calls for the United States to demobilize, as we have done after every great war, and reap the advantages of the "peace dividends." These calls for a peace dividend are not frivolous. They reflect real political and fiscal pressures that have created an environment in which radical reductions in military budgets and capabilities are no longer unthinkable.

In the current political environment in which the unthinkable is thinkable, it is imperative that the military not be simple pawns that are moved about and traded off. Historically, the cost of poor moves and bad trades has been war. To ensure reductions in military budgets and capabilities do not pave the road to war, the military must embrace the process of change and help direct its flow. That means old "truths" that have served us well during the cold war and containment eras must be put to the test. One of those truths is the strategic deterrent triad of land-based intercontinental ballistic missiles (ICBM), manned penetrating bombers, and submarine launched ballistic missiles (SLBM). Given a world that demands fewer nuclear weapons and more strategic stability in the remaining weapons, is the triad still a truth, or is there a better way?

First the triad, as we know it today, is no longer a truth because we have not had a triad since the early 1980s when the first cruise missile went operational. The cruise missile is not a manned penetrating bomber, ICBM, or SLBM, even though it can be employed from aircraft, land-based modes, or the sea. The cruise missile has formed the fourth leg of a "tetrad." Once we accept that the traditional triad is not a truth, we can return to the basic principle of deterrence and take a fresh look at answering the question, Is there a better way?

To provide a foundation for analysis in this paper, the first section reviews the concept of strategic deterrence and the triad in terms of strengths and weaknesses. Next is an identification of the set of arms control ground rules and sizing assumptions used to test the "truth" of various strategic options, followed by an assessment of these options. This assessment suggests that arms control and budgetary constraints and a credible strategic deterrent posture are not mutually exclusive—there is a better way. More specifically, it argues that a new strategic triad of land-based strategic missiles, manned penetrating bombers, and cruise missiles simultaneously satisfies all three objectives—reducing the cost of strategic nuclear forces and the number of nuclear weapons while preserving a credible deterrence. The last section explores some of the long-range implications of this new strategic triad and the benefits it might offer our nation and the world.

Strategic Deterrence and the Triad

THERE ARE basically two forms of deterrence—deterrence based on denial and deterrence based on punishment. Denial deterrence (not to be confused with the US objective of "denying Soviet war aims") requires the capabilities and resources to defeat an attack without suffering significant damage. It is primarily defensive in nature and is the preferred form of deterrence since it directly protects and preserves that which we hold valuable. Unfortunately, a deterrence based on denial does not provide strong incentive against aggression or misconduct because it strictly limits the aggressor's costs and risks if he decides to strike. This rationale, coupled with the destructive potential of modern strategic weapons and the diversity of delivery options, precludes sole reliance on a denial deterrent strategy. Therefore, for the foreseeable future, US deterrent strategy must have as its foundation the concept of punishment.

Punitive deterrence has as its foundation the assured and acknowledged military capability to inflict the appropriate level of unacceptable pain in response to aggression, and the national will to employ that capability. For over 30 years the strategic triad and tetrad have been that capability. As fiscal and political pressures force reductions in the number of strategic weapons, it is absolutely critical that we take those reductions where they have the least impact on our ability to inflict carefully measured but unacceptable pain in response to strategic aggression. If we lose the ability to deter through punishment, stability will decrease.

Strategic stability, however, is coupled closely to a mutual perception of balance of capabilities. This critical balance need not be serendipitous. It can be carefully crafted through arms control agreements with provisions, noncooperative if necessary, to ensure absolute and unambiguous verification of compliance. Fortunately the fiscal and political pressures to reduce strategic arms are not our's alone. It appears the Soviets share in this burden and opportunity. Therefore it appears possible to tailor the reductions through arms control agreements so as to maintain a credible deterrence and simultaneously enhance international strategic stability. More specifically, it may be possible to enhance both deterrent credibility and stability by targeting for reduction those weapons that are the most destabilizing. For this reason it is imperative that the military establishment embrace the processes of change and provide critical direction.

The triad and tetrad have served world peace well since the early 1960s. The strength of the triad and tetrad has been in the ability of the various legs to compensate for vulnerabilities in each of the other legs. There is a synergism in the whole based on the strengths of each of the legs.

For example, bombers are the most flexible and versatile in terms of roles, missions, areas, and tempo. With the accuracy and discrimination inherent in their weapons and their heavy payload, they can be used across the entire spectrum of conflict. Because bombers are manned, they can be launched on warning and recalled; they can assess damage before restrike; they can surgically strike individual targets; and they can be reloaded again and again.

Land-based ballistic missiles characteristically have the highest alert rate and lowest operating costs. They have massive, prompt, hard-target-kill capabilities and, as a result, have incredible strategic "shock" power. They also are rapidly retargetable and have redundant and reliable positive command and control systems.

Submarine launched ballistic missiles have been considered the most survivable and enduring leg because our submarine stealth technology allowed them to hide effectively from all adversaries. With ample warning, the submarine has the capability for the most rapid response from launch order to warhead arrival.

Cruise missiles have enormous flexibility with deployment options that include all mediums of basing—land, sea, and air. However, the Intermediate-range Nuclear Forces (INF) Treaty has largely removed the land mode of deployment from consideration. These weapons are highly accurate and, due to their small size, easily hidden. Currently a second-generation cruise missile with improved range, accuracy, and penetrability is undergoing test and evaluation and will soon be available for deployment.

On the other hand, each weapon system in the triad/tetrad has weaknesses. The bombers are slow compared to the missile systems and are vulnerable to antiair operations and preemptive SLBM strikes, due to the SLBM's short time of flight. With a policy of launching only upon hard verification of a nuclear attack (nuclear detonations on American soil), ICBMs are vulnerable to a surprise mass missile raid because of the increasing accuracy and yield of the Soviet ICBMs. This tends to create a "use or lose" situation during the first few minutes of a nuclear exchange. The SLBM has a relatively low alert rate—for every three submarines in the inventory, only one is on alert station. The remainder are in transit, undergoing overhaul, or in port for replenishment, maintenance, and crew exchange. Command and control is potentially slow and unreliable due to the depths, location, and alert status of the submarines. Also, because the submarines operate autonomously in international waters, they could be attacked without assured retaliation. Cruise missiles, the fourth leg, share many of the vulnerabilities of the manned bomber. Before launch, they can best be defeated while still in the "nest" with their launch platforms. After launch, they fly at subsonic speeds with predetermined flight profiles to the target.

Even given these vulnerabilities, the triad/tetrad has been a formidable system of deterrence and has enjoyed almost universal acceptance and support for several decades. Interestingly, the Soviets have adopted a similar strategic deterrent strategy. But the world has changed, and yesterday's solutions are not necessarily the right answers for tomorrow. The threat to world peace is changing, and failure to meet those changes effectively and affordably will threaten the integrity, vitality, and credibility of our strategic deterrent forces. We must consider restructuring our strategic forces and negotiating similar changes in the Soviet arsenals. If we, the military, do not take the initiative, we are at risk of being unilaterally disarmed by domestic fiscal pressures without compensating reductions in Soviet capabilities.

Follow-on START Negotiation Objectives

THE PRIMARY United States objective in arms control must be to enhance our national security as the number of weapons are reduced. But as important as this objective is, there are other considerations that are vital to acceptance of any agreement when it is scrutinized by the public, military, and Congress; the Soviets; and the other members of the nuclear club. Some of these ancillary objectives are as follows.

Reductions must:

1. Preserve a reasonable strategic balance, increase overall strategic stability, and maintain appropriate levels

of weapons to support our deterrent strategy. Considering each country's target base, the US would need to counter between 6,000 and 7,000 targets and the Soviets one-half that number for each side to hold the other at risk. One side cannot be asked to give substantially more than the other or to accept a position of strategic inferiority.

2. Address systems that are significant threats to US security and continue to support the US nuclear doctrine of flexible response. Arbitrary numbers as "total weapons goals" defeat our deterrent strategy of sufficiency. The final results of any reduction must support our requirements.

3. Be absolutely verifiable without invasive, complex inspections. Reduction modifications to weapon systems must be impractical or impossible to reverse.

4. Limit the number of launch platforms under the premise that it is difficult or impossible to verify compliance at the individual weapon level.

5. Be simple to quantify and equate—specifically, reductions should be in kind. For example, the INF Treaty eradicated missiles for missiles and resulted in the elimination of an entire class of weapons.

6. Be politically acceptable within the general US population and be significant in terms of reducing the number of nuclear weapons available to any nation included in the negotiations.

7. Result in lower costs in the strategic arena and not require significant increases in tactical systems to compensate for the reductions; that is, they must be cost-effective.

8. Reduce the probability of losing control of nuclear weapons as the result of an accident, sabotage, or radical change in either internal or external politics of the parties involved. This is particularly important today with the rapid changes taking place in Eastern Europe and the internal unrest within the Soviet Union.

9. Not create incentives to violate the terms or intent of the agreements.

Assumptions on Sizing Future Reductions

The trend in nuclear force structures is to "build down." This is a significant change from the "buildup" mentality of the 1970s and 1980s and represents a major challenge to those charged with designing deterrent force structures that will ensure peace.

The first assumption is that the current START proposals will be ratified without major change in their limits or definitions. The current proposal on the table at Geneva limits total accountable warheads to 6,000. Of these accountable warheads, 4,900 can be on ballistic missiles. Additionally, each side is limited to 1,600 strategic nuclear delivery vehicles (SNDV). Each ballistic missile or bomber counts as one SNDV. The bomber counting rule is embedded in the proposal and is designed with two main goals in mind: to encourage each side to place warheads on more stabilizing weapon systems such as bombers and to simplify the counting procedures for air launched cruise missiles (ALCM). The INF Treaty addresses land-based cruise missiles, but sea-based cruise missiles are not included in the discussions.

The US position the one that seems most likely to be approved, is to allocate a value of 10 ALCMs to each ALCM-capable aircraft. This counting rule allows each side to "discount" the ALCM carrier as to the number of ALCMs actually carried. Therefore, an aircraft that can carry more than 10 ALCMs will be assessed a warhead value of 10, while the aircraft counts as one SNDV. These bomber and ALCM counting rules explain the difference in *accountable* and *actual* weapons.

Another assumption, in view of the changing threat, is that there will be pressures to further reduce the strategic arsenals of the superpowers. Further, these reductions would be framed in similar types of limitations and have the same goals as previously listed. Primary among these goals is the desire to enhance stability as the strategic inventory shrinks. In an effort to bound the problem of a hypothetical START following the current effort, this paper has assumed a further 50-percent cut in strategic forces with the same type discount rules and limitations that are currently being considered. The force structures would have the following limitations: 3,000 accountable warheads of which 2,450 could be on ballistic missiles, and 800 SNDVs.

Options to Reach the New START Limitations

Outlined below are six options to size the strategic forces to meet the assumed START limits. There are an infinite number of options and force numbers that could be investigated, but these six are representative and offer a realistic comparison while bounding the problem.

Option 1 is the base case and shows that major cuts in the tetrad will be required to fit future START limits. This option requires the reduction of over 250 SNDVs and half of the accountable warheads. Due to the bomber discounting rules and the ballistic missile warhead limits, the majority of cuts must be made in the multiple warhead systems, the ballistic missiles. Each Minuteman (MM) III has three and each Trident D-5 missile has eight accountable warheads. Therefore, the elimination of each SNDV in these systems eliminates three or eight accountable warheads.

Option 2 shows the elimination of all land-based ICBMs and results in a triad of bombers, SLBMs, and cruise missiles. Due to START limitations, this option stops SLBM submarine production after Trident 13, and reduces tube capability from 24 to 23 in order to meet the 2,450 limit of ballistic missile warheads. However, this reduction in SLBMs still exceeds the accountable warhead limit of 3,000 by over 500. Options 3 and 4 reduce the numbers of ALCM carriers and SLBMs to achieve START limits.

To meet the assumed START limits, option 3 reduces the number of ALCM carriers (B-52H) from 95 to 43. This action meets the limitations but results in the loss of 1,040 actual warheads, again because of the bomber/ALCM discount rules.

Option 4 reduces the number of submarines to 10, with 23 versus 24 operational tubes to meet the 3,000 accountable warhead limit.

Option 5 maintains the tetrad but reduces each ballistic missile leg. Each leg is small with nine submarines with 14 tubes each, 123 MM IIIs, and 50 Peacekeepers.

Option 6 includes ICBMs, bombers, and ALCMs and is the option that best balances the three constraints of the assumed START limits—SNDVs, accountable warheads, and ballistic missile warheads—while providing over 6,800 actual warheads.

Details of Options

Option 1: Maintain tetrad—retire Minuteman II, cap Trident submarines at 13 of planned 21 (nine are at sea and seven are funded).

SNDVs		*Accountable Warheads*	*Actual Warheads*
50	Peacekeeper (PK)	500*	500
312	D-5	2,496*	2,496
425	MM III	1,275*	1,275
95	B-52H (ALCM Carrier)	950	1,900
97	B-1B	97	1,552**
75	B-2	75	1,500**
1,054***		5,393	9,223

*Total of 4,241 accountable ballistic missile warheads. START would allow only 2,450.

**Based on 16 internal weapons per B-1B and 20 per B-2. Numbers could fluctuate depending on weapons configuration and fuel load. Reduction from 132 to 75 B-2s would reduce B-2 weapons to 1,500, a loss of 1,040 weapons and 57 SNDVs.

***Total of 1,111 SNDVs. START would allow only 800. Option 1 requires reduction in SNDVs and accountable warheads to meet assumptions about START limits.

Option 2: Retire all ICBMs. Fill 23 of 24 tubes on 13 Trident submarines to remain below 2,450 ballistic missile warhead limit.

SNDVs		Accountable Warheads	Actual Warheads
299	D-5	2,392	2,392
95	B-52H	950	1,900
97	B-1B	97	1,552
75	B-2	75	1,500
566		3,514*	7,344

*3,514 exceeds 3,000 accountable warhead limit. Option 3 reduces B-52Hs and option 4 reduces SLBMs to reach warhead limit.

Option 3: Reduce B-52Hs to 43, keep 13 submarines.

SNDVs		Accountable Warheads	Actual Warheads
299	D-5	2,392	2,392
43	B-52H	430	860
97	B-1B	97	1,552
75	B-2	75	1,500
514		2,994	6,304

Option 3 results in a loss of over 55 percent of B-52Hs (the primary conventional strategic asset after the mid-1990s) and has the lowest number of actual weapons of any of the options.

Option 4: Reduce submarines to 10 with 23 tubes each to reach limits.

SNDVs		Accountable Warheads	Actual Warheads
230	D-5	1,840	1,840
95	B-52H	950	1,900
97	B-1B	97	1,552
75	B-2	75	1,500
497		2,962	6,792

This results in a cancellation of three Trident submarines compared with option 2.

Option 5: Tetrad with small ICBM and SLBM legs. Nine submarines have 14 tubes.

SNDVs		Accountable Warheads	Actual Warheads
126	D-5	1,008	1,008
123	MM III	369	369
50	PK	500	500
95	B-52H	950	1,900
97	B-1B	97	1,552
75	B-2	75	1,500
566		2,999	6,829

Option 6: Triad of ICBMs, bombers, and ALCMs—eliminate all SLBMs.

SNDVs		Accountable Warheads	Actual Warheads
50	PK	500	500
459	MM III	1,377	1,377
95	B-52H	950	1,900
97	B-1B	97	1,552
75	B-2	75	1,500
776		2,999	6,829

Assessment

A TRIAD OF land-based ICBMs, ALCMs, and bombers, like the one described in option 6, meets all the negotiation objectives listed earlier. This modernized triad offers all the strengths of the current tetrad and eliminates the weaknesses, such as low alert rates and poor connectivity ingrained in the SLBM. These changes also increase stability in the nuclear response forces by eliminating the greatest threat to our national command authorities (NCA), bomber force, and command and control systems—the Soviet SLBMs. Due to the mobility factor of the modernized ICBMs—rail-mobile Peacekeepers—the ICBM leg will regain the survivability it lost with deployment of modern, accurate Soviet ICBM systems. Like the SLBMs, the Peacekeepers will be able to deploy and hide in millions of square miles, thus making them survivable and enduring. Additionally, by eliminating SLBMs, our nuclear forces would be more mission survivable, due to more time for secure,

reliable communications with the NCA, and result in more weapons available for deterrence due to the high alert rate of ICBMs. The SLBM alert rate is approximately 30 percent, while the ICBM alert rate is over 95 percent.

Eliminating the SLBM from both superpower inventories increases stability. As we look at reductions, normally we focus on "what we give up" and neglect "what we get" when the other side gives up a weapon system. The elimination of the Soviet SLBM threat is the single most compelling reason to replace the tetrad with this triad. The Soviet SLBM is the system that most directly threatens our NCA, bomber force, and the connectivity with all our nuclear forces, due to the short flight time of Soviet SLBMs. These flight times may be as small as eight minutes depending on geographic target location and submarine location. This short flight time forces our NCA to near instantaneous response decisions upon notification of "missiles inbound." Elimination of this threat would increase our attack assessment and decision response time three- to four-fold over the amount of time we have for these critical decisions today. These extra minutes make the difference in a measured response versus a nuclear spasm.

This triad will aid in our doctrine of flexible response due to reliable communications with these land-based forces and greater survivability. These forces can be retargeted much easier and quicker than those at sea, and by maintaining a strong mix of bombers, the NCA will have readily available forces to target a single weapon against a single target if desired. With more weapons on alert compared to the number available with the SLBM, our national command authorities would have more flexibility in response options than with other triad mixes. For example, if an SLBM were used for selective strike, the target would receive eight warheads in a constrained "footprint." Additionally, it is chancy to fire only a portion of the SLBMs on a submarine and be assured the remainder are secure for later use, due to the chance of revealing the submarine's position and making it vulnerable to antisubmarine warfare (ASW).

A comparison of the number of ballistic missile alert weapons available reveals 1,877 for option 6 (the recommended option) and 552 for option 4 (the SLBM and bomber triad). Over three times as many ballistic missiles would be available for retaliatory strike by using ICBMs instead of SLBMs. In option 4, there would only be three submarines on alert (in firing position) at any one time. A single Soviet torpedo, stray mine, or catastrophic accident could reduce the nation's ballistic missile deterrence by 33 percent if a single submarine were lost.

SLBMs would be the simplest leg of the tetrad to eliminate in terms of arms control verification and the one most impractical to reverse once the submarines have been rendered incapable of supporting a SLBM or destroyed, depending on the terms of the treaties. Each nation's requirements for submarines to perform other duties, like defending sea-lanes of communications, would not be hampered by these agreements. Each nation knows exactly how many SLBM submarines the other has and each has already instituted varying degrees of verification/counting procedures for SLBMs under current treaties. It would be simple and minimally invasive for each side to ensure that the SLBM submarines were either destroyed, modified for other uses, or had their SLBM hatches welded shut after being filled with ballast materials.

Elimination of an entire class of weapons, in this case SLBMs, would be in concert with recent reductions in nuclear weapons. The INF Treaty was heralded around the world as a major breakthrough in arms negotiations. This

type of reduction was so unique that the nuclear doomsday clock, that has been slowly inching its way toward midnight (doomsday) for the past few decades, was set back a few minutes, signifying a safer world. Destruction of another class of weapons instead of piecemeal reduction of all types—no matter the number—has an impact that cannot be matched by other avenues of cuts.

The only objective not yet addressed directly is the issue of cost. Even though cost should not be the major criterion when the security of the nation is at stake, we cannot dodge the issue in this era of public demand for less defense expenditures. If the nation can provide for its security more efficiently, then it should do so. In a period of further START reductions, like those outlined thus far, we *can* have increased security for less cost.

It is difficult to determine an exact cost for the options discussed, but the following figures will serve to illustrate the magnitude of the savings if we were to adopt the ICBM/bomber/cruise missile triad. The ICBM is the most cost-effective leg of the current tetrad, consuming approximately 19 percent of the annual support costs while carrying 75–80 percent of the warheads in day-to-day alert. The support costs for the SLBM is over 50 percent more than that of the ICBM, while that force carries approximately 15 percent of the day-to-day alert warheads. Additionally, the procurement cost of each Trident SSBN with D-5 missiles is approximately $2.2 billion, not including such items as crew; maintenance; research, development, test and evaluation (RDT&E); and support. The Navy plans on procuring 21 of these boats—nine are already under way, seven are in various stages of construction or funding, and another five are in the out-year budgets. Ignoring the possibility of canceling current construction or funding, we plan on spending $11 billion on the remainder of the SLBM fleet. By comparison, the Peacekeeper rail garrison's (rail-mobile ICBMs) cost for deployment is $5.6 billion spread over seven years (fiscal years 1989–95).

By any method of cost analysis, a triad of ballistic missiles (mobile Peacekeepers and Minuteman IIIs), ALCMs, and bombers is more cost-effective and cost-efficient than any option that includes SLBMs. The SLBM has redundant capabilities in a modernized triad, at a higher cost when compared with the ICBM—50-percent higher operating cost, one-third of the alert posture, and enough current and out-year funding to pay for mobile Peacekeepers three times over. In an era of future arms reductions and tightening budgets, a deterrent structure that includes the SLBM is "nice to have," but it is not necessary to the security of this nation and is not fiscally responsible. Most importantly, elimination of SLBMs from both sides *increases* stability and security. In a final accounting, the United States really does get "more for less" if SLBMs are eliminated through START negotiations.

Long-Range Benefits

THE PURPOSE of this paper has been to advocate a change in the deterrent strategy of the United States—reshape our strategic nuclear forces to a triad of ICBMs, bombers, and cruise missiles. To ensure that this shift is not a shortsighted exercise that leaves this nation vulnerable or without flexible options for the future, it would be prudent to look at the impacts of this change.

Bomber and Missile Survivability

If we eliminate submarine launched ballistic missiles, then we must answer the fundamental question: How does the

US ensure the survival of a retaliatory force in a surprise attack? First, the bombers are more survivable in a world in which nations have eliminated SLBMs because the attack warning time will be substantially increased. Since the bombers are recallable, they can be launched on warning provided by satellites. Satellite warning time corresponds to 20 to 30 minutes.

While the bombers are recallable if launched on warning, missiles are not. This creates a powerful incentive to not launch on warning of an attack under the presumption that the attack warning system may malfunction. For the purpose of this analysis, the author presumes that the missiles would not be committed to launch until the attack is verified by the occurrence of nuclear detonations on sovereign US soil. Given the accuracy and yield of the Soviet ICBMs, such a presumption places the nonmobile, land-based missiles at risk in a preemptive strike.

If, however, absolute verification of an attack can be moved forward in time to about 15 minutes before the first warhead impacts, mission survival of the land-based missiles would be assured by launch upon that verification. That absolute and timely verification of an attack could be provided by a very limited deployment of the first phase of the Strategic Defense Initiative (SDI) shield. With the SLBM eliminated, the practical azimuths of attack on the missile fields are reduced, allowing a single Antiballistic Missile (ABM) Treaty-compliant defensive system to absolutely guarantee mission survival of the nonmobile ICBMs. Such an ABM system would defeat any small-scale attack, accidental or otherwise, while providing the capability to definitively probe—that is, *absolutely verify*—a large-scale attack against the United States. Once the attack is probed—that is, a number of intercepts made and the debris remotely evaluated to determine the types of warheads involved—the NCA could release the ICBMs that were at risk for a retaliatory strike.

Nuclear Terrorism

Currently, four developing nations have nuclear weapons and seven have long-range missile systems. By eliminating SLBMs from the arsenals of the superpowers, the Soviet Union and the United States would be less likely to be "tricked" into war by an unstable third-world dictator, like Muammar Qadhafi. Proliferation of sophisticated weapons and delivery systems is accelerating, and they are available to those willing to pay the price. In the current decade, it is not unthinkable that the means of underwater missile deployment could become available to these same third-world countries.

Under current force profiles, if a nuclear-armed weapon were launched from under the sea and impacted on Soviet or US territory, each of the superpowers would blame the other, and denials may not come quickly enough to avert catastrophe. The Soviets have an excellent capability to look into our missile fields, as we do theirs, and determine if an ICBM came from our soil. However, their capability to detect a launch from under the oceans is limited. The United States is not similarly limited in this capability, but once launched and in the absence of conflicting information, the US would assume that the missile was Soviet. By removing the SLBMs from both inventories, the United States and Soviet Union would know that an SLBM attack would not be the work of the other country and would avoid being dragged into a nuclear exchange by a third party.

Technological Breakthroughs

One of the reasons the triad/tetrad has always enjoyed support has been the rationale that a technological breakthrough

could render one of the legs vulnerable but not put our deterrent strategy at risk. To this end, it appears that the Soviets have already made inroads into the strengths the US has enjoyed in submarine technology and antisubmarine warfare. Improvements in the Soviet Delta IV and Typhoon submarines have made them quieter, and they are armed with more accurate missiles. Therefore they are more difficult to pinpoint and they put more of our forces at risk, including many of our "hard" targets. Each generation of Soviet submarine is quieter and narrows the technology gap, making the new ships more difficult to track and defend against. The Soviets appear to believe the technology to hide their submarines is within their reach, and they fund it appropriately.

The Soviets also heavily fund their ASW effort, and both the US and Soviets are working feverishly to make improvements. Currently, the US and its allies have the advantage in ASW; however, the Soviets are pursuing the technology to develop a space-based ASW surveillance system that theoretically could render the oceans transparent to great depths. It is only logical to assume that the US is pursuing similar capabilities to defend primarily against the SLBM threat.

Indirect "Savings"

Assuming the SLBMs are eliminated through START negotiations, there are other savings that could be realized in a more stable and secure world environment. The US military stands ready to respond to Soviet nuclear attack at "a moment's notice." This capability to react instantaneously is known as alert. There are thousands of military members on alert at this very moment, each ready to respond. This capability is costly, not only in dollars, but also in human stresses—and stresses can cause mistakes. It is entirely feasible and reasonable that a reduction in the threat could be accompanied by a relaxation in the number of systems on immediate alert or the level of alert status. As an example, the US bomber force commits approximately one-third of its airframes to immediate alert, known as alpha alert. The crews are restricted to the alert facility or selected parts of the base to be able to launch their aircraft in a matter of minutes.

If the primary threat to the alert aircraft, the SLBMs, was eliminated and the air crews had three to four times the reaction times they now have, it is logical that a reduced alert status would be appropriate. In and of itself, this is a less threatening and more stabilizing position with no loss of security. A similar case could be made for the ICBM force, depending on the deployment mode and location.

Conclusion

THE OVERARCHING thesis of this paper is that the United States must seize the changes that are taking place in the world and benefit from them. It is time to act and not react—a time to set the agenda and make our world safer and more secure. At the same time, we must realize that the biggest threat to our national survival is still the nuclear forces of the Soviet Union. Our objective remains as it always was—to counter that threat. In the past decades both nations have countered the threat of the other by building *up* their arms, and in doing so, the balance that each was trying to obtain became unstable. With the recent changes in the Soviet Union, for whatever reason, the door is open to a build *down* in nuclear weapons, and the opportunity to add stability to the remaining systems is within reach.

As we reach for that opportunity, some of the "truths" that have served us well during the arms buildups should be revisited to determine if they are relevant to the end position each side is striving to obtain—security, stability, and reduced costs. While elimination of an entire class of nuclear weapon systems reduces the threatening posture of each side, elimination of the SLBM most enhances those objectives. With its removal, the nation's deterrent strategy is still served by a triad that has all the benefits of the former triad and tetrad. At the same time we enjoy these benefits for less cost in a safer world. A triad of ICBMs, bombers, and cruise missiles does give this nation "more for less."

A Note on Essay Sources

The data in this essay was compiled from numerous unclassified Department of Defense publications dealing with strategic nuclear force structure and arms control issues, as well as from sources in the nonmilitary sector. Two references, in particular, provided conceptual and quantitative material for the essay:

Barry R. Schneider, "Dyad or Triad," *Defense & Diplomacy* 7, no. 9 (September 1989): 30–35; and Arms Control and Disarmament Agency, *Issues Brief: Strategic Arms Reduction Talks (START)* (Washington, D.C.: Government Printing Office, 25 April 1991).

Essay 3

A SIOP for *Perestroika*?

by

Col Richard Szafranski

Introduction

War is hell, but peace is a pain in the ass.

—James Schlesinger

IN EVERY struggle there is what Carl von Clausewitz described as the "culminating point of victory." This is the point at which one side, apparently successful, must end the attack, revert to the defense, and accept the peace. If the victor-presumptive does not realize that the culminating point has been reached and continues to press forward, the struggle can be lost. Defeat, it is said, can be snatched from the very jaws of victory. The culminating point in the cold war to contain a hostile Soviet will has been reached. We may be on the verge of *overshooting it. If we do, our* hard-won victory could become a costly defeat. The issue hinges on the single integrated operational plan (SIOP) we build for *perestroika.*

The general nuclear war plan of the United States exists to deter nuclear aggression. This plan—called the SIOP—is the vehicle for applying nuclear strikes against the Soviet enemy. Our strategic nuclear forces and the SIOP deter aggression by having the capability to devastate the Soviet Union should that nation cause deterrence to fail. The SIOP is not a static plan. Changes in capability, constraints levied on it, evolving visions of what deters best, and presidential guidance all affect the plan.

Perestroika seeks to increase and enhance Soviet national power over the long term. It plans to accomplish this objective by introducing democratization within the Soviet Union and its former client states, reforming Soviet economic structures, improving superpower relations, and altering Soviet military capabilities. Thus, *perestroika* exerts pressure on each of the elements influencing the SIOP. That the SIOP will change is inevitable.[1] That we have the wisdom to structure those changes according to a shared vision of the role of nuclear force in the future is not. Unless we apprehend the essential element underpinning deterrence theory, share a vision of nuclear strategy with the Soviets, and restructure our forces and plans to be faithful to it, we will have passed the culminating point.

The positive outcomes of *perestroika* for the United States ultimately will be determined both by our beliefs regarding Soviet will and intent and by reassessment of our present deterrence theory. Unless we reconsider our views regarding Soviet will and intent and, in so doing, return with them to the first principles of the deterrence paradigm, our opportunity for a better future may pass. That better future is one in which our reliance on nuclear weapons as the ultimate guarantors of our security and arbiters of our destiny is greatly diminished—diminished, in fact, almost to the point of vanishing.

This thesis rests on the assumption that since Soviet and presidential declarations support pursuit of arms reductions, both weapons and delivery vehicles will be reduced. If risk reduction is truly a goal, the number of missiles will be reduced more sharply than the number of bombers, causing changes in the com-

position of SIOP alert and generated forces. If, in this process, both the United States and the Soviet Union can come to share a vision of nuclear deterrence, a mutually accepted and supported strategic relationship could result. Of all the forces influencing the SIOP, the restructuring of superpower relations has brought us to the culminating point. It has the potential to cause the most profound and enduring changes.

The Challenge

THE RESTRUCTURING of international relations has led to a new Soviet commitment to active diplomacy and an agenda which includes the pursuit of arms reduction initiatives. Mikhail Gorbachev himself spearheads the campaign to restructure international perceptions of the Soviet state as benign, reforming, and peacefully progressive. His position is summarized in the conclusion to his book:

> We want peaceful competition between different social systems to develop unimpeded, to encourage mutually advantageous cooperation rather than confrontation and an arms race. . . . The road to this lies through proceeding to a nuclear-free, non-violent world. We have embarked on this road, and call on other nations to follow suit.[2]

Apparent commitment to this position resulted in the announcement that Soviet tanks would be unilaterally withdrawn from East Germany, the agreement to retain fewer Soviet troops in Europe than the United States is allowed to retain, participation in defense and space negotiations, discussions to eliminate chemical weapons, negotiations to withdraw Soviet forces from Czechoslovakia and Poland, the agreement to eliminate intermediate nuclear forces from Europe, and Strategic Arms Reduction Talks (START) aimed at reducing nuclear weapons and strategic delivery vehicles.

Other evidence of new Soviet thinking includes the admission of past errors—the invasions of Czechoslovakia and Afghanistan and construction of the illegal missile warning radar at Krasnoyarsk. Exchanges of information, visits by senior military officers, intrusive inspections, and access to nuclear facilities, sensitive military installations, and state-of-the-art equipment (new bombers, fighters, and cruisers) further reinforce a new spirit of openness and cooperation. All of these were virtually unthinkable two years ago. All are nearly routine now.[3]

Of all the fertile areas for cooperation, reductions in nuclear forces are essential for improved relations. Since nuclear weapons cannot be "uninvented," it is unlikely either superpower will eliminate nuclear weapons entirely.[4] Nonetheless, the pursuit of reductions appears consistent with both Gorbachev's declarations and the 27th Congress of the Communist party's decision that a "purely defensive" military doctrine be "developed and implemented."[5] Even without confirmation that a new doctrine has been fully implemented, both superpowers will likely at least agree to begin the process of reducing strategic nuclear arms. Support for this thesis exists in President George Bush's comments to reporters after his meetings with Gorbachev at Malta and also in the New Year's messages exchanged by these heads of state.

On the island of Saint Martin, following the meetings at Malta, President Bush told reporters:

> We've instructed the Pentagon to do some very serious analyses in terms of looking at what kind of force will be needed into the future, estimating as best they can what the threat will be. So, we're in the process of doing that right now . . . but I would not look for the administration to send up dramatically reduced levels of spending in defense. I hope some day that we can have a *far*

> *different force, and deployed for differently* [emphasis added].[6]

In his New Year's message to the people of the United States, Gorbachev said:

> We are deeply convinced that an epoch of peace is feasible. We, the Soviet Union and the USA, it seems have already made a choice, a choice in favor of cooperation. . . . During the Malta meeting, President Bush and I agreed that it was essential to get away from the cold war and this means abandoning cold war instruments as well.[7]

President Bush responded in his message by saying:

> We agreed to redouble our efforts to diminish the horrible threat from weapons of mass destruction and to pursue with other nations an agreement to reduce conventional forces in Europe . . . We should redouble our efforts to forge a new century of peace and freedom.[8]

Thus, the president of the United States and the head of the Union of Soviet Socialist Republics and the Communist Party of the Soviet Union defined how superpower relations would be restructured. They have suggested at least one outcome of improved relations that will affect strategic nuclear forces: reduction of the threat posed by weapons of mass destruction.

The Significance of the Challenge

THE THREAT from nuclear weapons can be diminished even if nuclear weapons are not entirely eliminated. Large reductions are the most direct way to diminish it. Reductions in nuclear weapons on both sides will likely reduce the size of the forces available for employment, change the composition of strategic nuclear forces, and decrease the number of Soviet nuclear force installations. Although each of these results will be examined, the inevitable conclusion is that a future nuclear war plan could rely on alert bomber forces to hold Soviet economic and industrial installations, leadership, and conventional forces at risk. The smaller alert missile force and the entire generated force could hold Soviet missile forces and generated forces at risk.

Unless the size of the force available to employ nuclear weapons is reduced as the number of weapons is negotiated downward, there will be little diminution in what is accurately characterized as a horrible threat. Superpower strategic nuclear arsenals today are estimated to contain over 22,000 weapons, with a total equivalent explosive power of over 10,000 megatons, or 10 billion tons, of TNT.[9] Since a single megaton is equivalent to approximately 70 simultaneous Hiroshima explosions, the thought of 700,000 Hiroshimas is too horrible for human comprehension.[10] Thus, an earnest desire to reduce the threat must result in reductions of both weapons and delivery vehicles. If negotiations are successful, a future SIOP must allow for having fewer weapons to employ.

Some Possible Responses

AS WEAPONS and delivery vehicles are reduced, the composition of the SIOP force will change too. It will change whether we preserve our current view regarding deterrence or embrace some more basic, but equally compelling, view. The relatively brief interval between launch and detonation and the large number of warheads that can be delivered in a short period of time make land- and sea-based missiles on alert the most serious component of the threat. The Strategic Defense Initiative (SDI), aimed at countering Soviet ballistic missiles, supports that view. As the number of delivery vehicles is reduced through negotiations, efforts to curb missile warheads will likely be a priority.[11] To reduce the number of Soviet missile warheads below 4,900, we will eventually have to

reduce our own forces.[12] Since preserving a large number of missiles on both sides will not appreciably diminish the threat, both sides must greatly reduce their numbers of this class of weapon if they are sincere about reducing the threat.

Reducing the numbers of missiles and missile warheads does not preclude modernizing the land-based missile force. Any new missiles acquired will most likely replace older missiles already deployed. Our vision of nuclear weapons as either war-fighting tools or instruments of deterrence will determine the characteristics of new missiles. In terms of war-fighting capability, mobile missiles provide significant advantages over land-based missiles in fixed silos.

Mobile missiles are more survivable because they are harder for the enemy to find. Mobility forces the adversary to cope with many potential launch points, thereby greatly complicating the targeting problem. Yet, three former chairmen of the Joint Chiefs of Staff testified that there was no need for planned rail- and road-mobile systems.[13] One suggested that if missile mobility were deemed advantageous, sea-launched systems could provide that mobility. Seaborne mobility also avoids initial development costs for new systems and basing schemes and some of the recurring costs for military personnel to provide crews for the force. Although existing sea-launched systems do provide mobility, they do not provide targeting or retargeting flexibility. In addition to targeting flexibility, verification schemes and risk-reduction protocols are easier for new land-based mobiles than they are for either submarines or a large number of older missiles in hardened and fixed sites. Unlike older systems, new missiles and basing modes can be designed to facilitate verification.

In the most restrictive case for land-based mobile systems, both sides can agree to keep the missiles in garrison, maintain the launchers and warheads in separate locations, and announce any movement or mating training in advance. Similarly, the allowable numbers of missiles in submarine launch tubes can be verified in port, and training can follow similar protocols. Whether land-based mobile missiles are deployed or not, future strategic forces will be smaller and have fewer missiles. Fewer missiles, in turn, will probably mean comparatively more mobile missiles. If land-based mobile intercontential ballistic missiles (ICBM) are not acquired or are bargained away, sea-launched missiles will continue to provide mobility.

If we continue to think of deterrence in the same ways as we do today, SIOP forces must be able to assure a certain amount of damage to different categories in the adversary's target system. Thus, if the numbers of missiles are reduced, bomber forces will likely be chosen to "make up the difference" in the amount of damage SIOP forces must threaten or inflict.

If threat reduction is important, bombers have the advantage of promoting crisis stability by being ill-suited for surprise attacks. Even after they are launched, they can be redirected or even recalled. In a dynamic conflict bombers can respond to changed taskings. Not only are they the least threatening and most flexible of the strategic delivery systems, they are also the only reusable and multipurpose delivery vehicle in the SIOP.[14] They can be used in both conventional and nuclear roles. They can strike precisely both hardened and other targets. Armed with cruise missiles and sent out to fight a nuclear war, a single bomber can threaten wide areas. As the only systems in the SIOP with utility outside the SIOP, bombers alone are able to bridge the gap between nuclear and conventional warfare.

If the most likely class of future conflicts is the armed intervention or small

war, bombers are the only strategic system that performs tactical nonnuclear strikes. Since even small wars could require penetrating sophisticated air defenses for air raids or strikes against ground or maritime targets, the aircraft employed must be highly survivable. Because a stealthy bomber has higher survival potential than other high-weapon-delivery-volume, long-range aircraft, future bomber forces will likely consist primarily of stealthy bombers.[15]

If future strategic forces are structured to reduce the threat posed by large numbers of deliverable nuclear weapons, not only will the size and composition of the total SIOP force change, but the portion of the force on alert will likely be different also. It will be different because its composition and tasking will change. Having fewer missiles on both sides will reduce the size of Soviet nuclear forces that must be attacked if deterrence fails and the number of missiles we have to attack them. Because a large number of quick-reaction missiles on alert *is* threatening, it is reasonable to assume that alert forces on both sides will be smaller.

If threat reduction is truly an important goal, the smaller alert force will also be made up predominantly of bombers. Thus, if the future SIOP force were "generated" to fight a nuclear war or deter the nuclear war we believe is about to begin, more missiles would be brought to full readiness, land-based mobile ICBMs would move out of garrison, and more submarines would put to sea. Generated missile forces would then be targeted against Soviet-generated targets. These would include missile forces (the missiles themselves for those that could be located, or the garrisons if the missiles could not be located), bomber bases, submarine ports, leadership installations, and other targets that must be destroyed promptly to meet the political objectives of a nuclear war. Bombers on alert would necessarily be planned against less-urgent targets. These would include economic and industrial installations, nuclear-force-sustainment facilities, some leadership facilities, conventional forces, and other military targets. Bombers possess the capability of being redirected in flight against other targets, including located mobile launch sites. When the bomber force has been generated to full readiness, its targets will not be changed appreciably.

Thus, a smaller total alert force built around less threatening bombers would have to pose a credible day-to-day threat to those targets that collectively constitute what we believe is the answer to the question, What kinds of threats deter what kinds of behavior and under what conditions?[16] The answer to this question may not change as the character of Soviet forces changes under *perestroika*.

First Principles

Ends and Means Are Linked

PERESTROIKA has forced us to return to first principles and examine the assumptions upon which strategic nuclear forces are procured and planned for employment. One such principle forming the basis of deterrence theory is that the end (the deterrence of massive conventional attacks, or nuclear aggression against the United States) is linked to the means (large standing nuclear forces and plans to employ them if necessary). But is this necessarily so? Brent Scowcroft points out an important qualifier in deterrence theory.

> Deterrence is a nebulous concept. It is composed of two elements: military capability and the perceived will to employ that capability. The only sure test of deterrence is failure. If a war results deterrence was inadequate. In the absence of a war, there is no certain way of knowing whether deterrence is working or if there was no intention to attack in any case.[17]

Thus, deterrence must presume its own success because the costs of validation are intolerable. We assume that at least the possibility of hostile will is manifest in Soviet strategic nuclear capability and that our own countervailing capabilities deter them from employing forces that threaten to hurt us and our allies. The validity of that assumption rests on the acceptance of one of two mutually exclusive corollaries. We must accept the view (1) that any diminution in hostile means indicates a reduction of hostile will, or (2) that although the adversary may preserve a hostile will, he recognizes that the likelihood of his being able to impose it declines in tandem with the reduction of his instruments of force.

If we believe that hostile will diminishes as hostile means are reduced, we are at the culminating point and must give evidence that our will is not hostile. The atomic bombing of Japan in World War II, retrospectively determined to have been unnecessary, is a clear indicator that our country lacked neither the will nor the capability to employ nuclear weapons.[18] Likewise, in the era of our nuclear superiority, Presidents John F. Kennedy and Richard M. Nixon both found increased nuclear force readiness a useful adjunct to political intercourse about missiles in Cuba and war against Israel. Massive strategic force investment during the Reagan administration expanded and refined our instruments of potential nuclear violence.

Said another way, our present large and capable nuclear forces must appear just as potentially hostile to the Soviets as theirs do to us—the difference being that the Soviets, or at least the head of the Soviet state and his key military staff, accept that our intent is *not* hostile and, concomitantly, assert that Soviet will is not hostile either.

On the other hand, if we believe that the Soviets preserve a hostile will, then we may be about to overshoot the culminating point, and before passing it we must explain the other facets of *perestroika* in terms of this hostile will. We must also explain why a hostile state would offer to reduce the military means upon which successfully imposing a hostile will would presumably depend. To argue that we cannot know Soviet intent (an argument used in the past when potentially hostile will was manifest in a great many ways), and so must preserve the means to deter or defeat Soviet capability across the threat spectrum, appears reasonable and prudent on the surface.

More closely examined, however, such arguments seem to imply that we are unable to perceive or unwilling to accept the relationship between military means and political ends. Unless we believe that our own strategic nuclear forces (military means) have some primary purpose other than deterring aggression (political ends), it is incumbent on us to postulate the political ends which any other nation—including the Soviet Union—would use their nuclear forces to attain.

If our nuclear forces exist exclusively or primarily to deter Soviet aggression, it is increasingly difficult to explain why an aggressive state would offer to emasculate its aggressive means and behave in other nonaggressive ways. Likewise, if deterring us from using our nuclear weapons is the only political end we can ascribe to Soviet nuclear forces, we must conclude that nuclear forces per se have very limited utility, if any. We must also conclude that one of the first principles underpinning deterrence is that nuclear weapons deter nuclear weapons, and that whatever value nuclear weapons have resides in their possession rather than their use. The history of the nuclear era seems to indicate that this may be so.

First Principles
Utility of the Means

NUCLEAR WEAPONS did not deter North Korea from invading South Korea, nor did they deter the People's Republic of China from intervening in that war. Nuclear weapons did not deter the Soviets from actively sponsoring wars of liberation, nor did they deter the North Vietnamese from aggression against South Vietnam and against our forces in Vietnam. Our lack of success in deterring conflicts below the nuclear level might be explained by the inadequacy of our former strategy of massive retaliation. However, such an explanation does not account for our inability to deter Soviet adventurism in the era of flexible response.

The era of flexible response made the "small" or "limited" nuclear war theoretically possible. But the difficulty of characterizing the size of an attack, determining whether a small attack was merely the precursor of a massive attack, correctly predicting the adversary's response to a small attack, and controlling escalation all argued that wars would be either nuclear or nonnuclear. Only popular fiction suggests that any interim state is more than a theoretical possibility.

Thus, the most important of the first principles of deterrence theory is that the possession of nuclear weapons has little utility beyond deterring nuclear weapons use by others. If the weapons are used, the disastrous consequences are apt to be both global and prolonged—hence, the paradox that using them destroys their utility.[19] After more than four decades, nuclear parity, *perestroika*, and perhaps even our own national debt have brought us full circle to the conclusion reached by Bernard Brodie and the post-World War II United States Strategic Bombing Survey—the prevention of war is the end to which our efforts must be devoted and is the only role of our nuclear forces.[20]

The Paradigm Unembellished

IF THIS TENTATIVE conclusion is correct, then only the important ritual of negotiations and the quest for a shared vision of strategic nuclear deterrence stand between the present forces and much smaller ones. I say "ritual" because both sides may have to wait ritualistically at the culminating point to satisfy diverse constituencies. These constituencies must be convinced that force reductions are in the national interest, may mechanically continue to invest in systems they will eventually negotiate away, and must move slowly and ceremoniously as a safeguard against cheating and reversals. The shared vision may be easier to find because it is already embedded in our deterrence theory.

Even before the initial increment of nuclear force reductions is agreed to, both sides appear to accept the one important proposition necessary for a shared strategic nuclear catechism: a nuclear war cannot be won and must never be fought. Those are, in fact, the exact words in a joint statement issued by President Ronald Reagan and Gorbachev on 21 November 1985.[21] In agreeing to that principle, both sides now appear to accept that nuclear forces are maintained for two reasons: (1) to deter the other side from using nuclear weapons, and (2) to take punitive reprisals against the side using these weapons. Hence, the resulting theory holds that using nuclear weapons would cause damage disproportionate to the value of any political objective. But to stop one side from using its weapons, the other side remains willing and able both to inflict and to accept terrible punishment. In spite of its complexity, the SIOP today may be little more than an

elaborate and very large reprisal. If it is not, it could be.

The reprisal paradigm is as consistent with the values of democratized nations as any other deterrence theory. In fact, Herman Kahn called this a "talionic" approach, after the "eye for an eye, tooth for a tooth" system of justice.[22] Reprisals are also acknowledged and allowable under the international laws governing warfare.[23] Moreover, there is already a large component of punishment embedded in any nuclear war plans that direct attacks against economic and industrial targets located in more densely populated or urban areas.[24]

In the simplest terms, a reprisal theory of deterrence argues that the threat of horrible punishment deters and that the penalty for crossing the nuclear threshold will be horrible punishment.[25] Since this concept is implicit in present deterrence theory, shared acceptance of it should not be difficult. Nor should it be difficult to structure the strategic forces necessary to support reprisals or build the employment plans required to execute them. Our own SIOP, for example, may already have a large reprisal component in its economic and industrial targeting.[26]

Existing superpower nuclear forces and plans do not seem to be consistent with declarations that nuclear wars must not be fought and cannot be won. For example, the role of our strategic nuclear forces and the present SIOP is to deter first and defeat attack second.[27] The forces deter by having the capability at least to attempt to defeat an attack. To defeat an attack, sufficient bombers and missiles must survive a Soviet strike and then retaliate against the enemy. To ensure the survival of the retaliatory forces, we need bombers, land-based missiles, and sea-based missiles on alert. Such large and robust forces imply that a nuclear war could be fought.

Moreover, we depend solely on offensive forces to deter and defeat. The objective of limiting damage to our country is met not by active or passive defenses, but by deterring nuclear aggression in the first place. Yet, should we fail to deter, damage is limited only by attempting to strike Soviet nuclear projection forces before they can strike us. As a consequence, strategic nuclear forces must be further predisposed to taking the offensive. If our forces can cause more damage to the Soviet Union than Soviet strategic forces can cause to the United States, then we have presumably "defeated" the attack. This, in turn, suggests that we have at least one criterion—defeating the Soviet attack—by which nuclear war can be "won."

The START negotiations that are under way to reduce strategic arms suggest mutual theories of deterrence grounded in war fighting. The larger, more diverse, and more mobile Soviet forces are allowed to remain under *perestroika*, as diminishing the threat of these weapons becomes more difficult. Our own insistence on large, diverse, and mobile strategic attack forces may limit our negotiating capabilities.[28] Yet, every Soviet warhead eliminated through negotiations limits damage to the United States should deterrence fail.

Few thoughtful alternatives to accepting a reprisal-based SIOP exist, if large reductions are a goal. We might continue on our present vector with fewer weapons. We might both reduce our forces by some amount. (Even an actual 50-percent reduction would leave an estimated residual superpower arsenal of 5,000 million tons of TNT in over 11,000 weapons; 350,000 Hiroshima explosions instead of 700,000.)[29] Or, we might combine reductions with active defenses such as SDI or passive defenses like improved hardening and civil defense.

Continuing investment in SDI beyond basic research seems justifiable only if we believe a nuclear war may be successfully fought by either side. If we believe a

nuclear war is likely, or even possible, we must also believe that (1) Gorbachev's call for a more "nuclear-free" world is insincere, (2) the Soviets possess a hostile will, (3) they have a plausible political goal that would be met by nuclear war, self-destructive though it would be, and (4) even after arms reductions, they will have preserved the means to mount an attack that meets any imaginable criteria for success. Without those beliefs, the basis for deploying a unilateral system does not seem compelling.[30] Certainly the proliferation of nuclear weapons in the third world is a possibility, but it is probably a remote threat to our homeland.[31] Moreover, a shared vision of nuclear deterrence and a mutually supported strategic relationship would allow such threats to be handled by preemptive conventional raids.

Thus, we probably really have only two alternatives: (1) maintain the status quo while making a few cost-saving or cost-avoidance reductions on the margin, or (2) begin making deep reductions which will *eventually* move us toward very small reprisal forces. The strategic nuclear forces required in the near term are not necessarily dependent on which alternative our nation chooses. We still have to get to and through the near term to realize the long-term vision we select.

How Deep Is Deep?

IF WE ARE at the culminating point, the Soviets and some of our own legislators suggest that we in the United States are behaving as if we intend to overshoot it. Marshal Sergey Akhromeyev challenged Secretary of State James A. Baker in the Moscow Parliament:

> The Soviet Union has been reducing its armed forces for the last two years by 500,000 men and its military budget by 14 percent. The United States has barely reduced its armed forces and is only slightly reducing its military budget. I have the impression that while improving relations with us in the military sphere you continue to insist on acting in respect to the Soviet Union from a position of strength.[32]

And indeed, the force elements we are least likely to use (strategic nuclear land- and sea-based missile forces) were—until recently—scheduled for modernization, and the ones more likely to be needed *and* used (bombers, troops, and other general-purpose forces) are scheduled for reduction. The inevitable conclusion is that our nation could probably accomplish as much or more with considerably smaller strategic nuclear forces, and thereby avoid some of the burdens associated with nuclear arms. Of the many such burdens, three deserve emphasis: (1) The primary weapon systems and their peripheral or supporting systems are costly, (2) even after expensive initial investments are made, the primary and supporting systems must be periodically modernized, and (3) the costs accrue few benefits because the weapons appear to have become self-deterring.

Accurate and complete calculations of our nation's investment in its strategic nuclear triad are not possible. The primary weapons (bombers, land-based missiles, and sea-based missiles) are only single components of large systems. Those large systems include military personnel for operations and maintenance, training and training facilities, ports and bases, replenishment ships and aerial refueling tankers, security personnel and systems, communications equipment and networks (including command and control aircraft, ground networks, and satellite communication systems, many of these hardened, dispersed and jam-resistant), spare parts, test equipment and testing, ground-support vehicles, and so forth. Procuring and maintaining the primary weapons and the peripheral supporting equipment (to target the same large systems that exist in the Soviet Union) make the total costs very high.

Once procured, the primary weapon delivery vehicles and their supporting equipment must be periodically modernized by replacement or modification. Taken together, initial investment, recurring costs, and the costs of modernization are enormous.

While we may rightly categorize past investments as worthwhile "sunk" costs, we are now faced with the "opportunity" costs associated with continuing investment and future procurements.[33] High costs can be justified so long as large nuclear arsenals are useful. It is more likely than not that large numbers of nuclear weapons are no longer useful.

This is *not* an unhappy moment brought about by our wrongdoing, misdirection, or failure. Rather, it represents the culmination of years of effort deliberately focused on convincing the Soviets that we would do whatever was necessary to deny their strategic forces any war-fighting utility. We have eliminated the value of large Soviet nuclear offensive forces. But, in so doing, we have also diminished the utility of our own large nuclear offensive forces. Moreover, we may have reached the point where the weapons themselves are largely self-deterring. Both the knowledge and the ignorance of nuclear weapons effects deter us.

The domain of "knowns" associated with the employment of nuclear weapons provides as little consolation as that of the "unknowns." We know, for example, that weapons effects include blast, overpressure, and the release of destructive ionizing radiation.[34] Depending on the number of detonations, casualties could range from millions to hundreds of millions.[35] Although the consequences of a large number of detonations are not known, they could include global meteorological alterations, loss of agriculture, and persistent biomedical effects.[36] Because all these effects are so disastrous, we know that there can be no victor emerging from a nuclear war. Attack would inevitably lead to retaliation, retaliation would lead to follow-on attacks, and it is likely that all the societies involved in such a war (and many not directly involved) would be devastated. Thus, the horrible and potentially suicidal consequences of using nuclear weapons render them self-deterring. The Soviets, for example, must now realize that the results of the Chernobyl tragedy would pale when compared to even a single nuclear weapon detonation.

Perhaps there was a need for large numbers of such weapons in the history of humankind but, even if there were, that need finally appears to be passing. The next plateau of arms might be weapons designed for warfare in space. In the absence of agreements, laser weapons, microwave or electromagnetic pulse weapons, and charged-particle weapons are likely to emerge more quickly. Unless the nations of the world are genuinely committed to controlling arms, rapid advancement to the next plateau is possible.

If the United States and the Soviet Union began by sharing an authentic commitment to reducing the threat posed by nuclear weapons, they could simultaneously capitalize on and improve relations under *perestroika*.[37] A shared belief that nuclear weapons are suitable only as instruments of reprisal could form the basis for a new strategic relationship. That belief would also allow both nations to reduce strategic forces and avoid the costs associated with their modernization and maintenance.

Military might is one of several instruments of national power. Economic strength is another. Unless our national power is balanced and robust in the aggregate and our economic strength restored, we might find ourselves ill-equipped to compete with Japan and the emerging European community. Viewed in this light, strategic nuclear

force reductions would serve to enhance our security, not erode it.

Sharing such a vision, the United States and the Soviet Union would need only enough nuclear weapons and delivery systems for each to establish a sufficiently punitive reprisal.[36] Only small alert forces would be required, and these could be built around delivery systems unsuitable for surprise attacks. "Deep," then, could be "very deep."

Nonetheless, small nuclear reprisal forces do not require that either the United States or the Soviet Union resign their positions as nuclear-armed superpowers. Both sides would likely deem it prudent to find parity at a level that exceeded the combined nuclear capabilities of the other major nuclear powers—the United Kingdom, France, and the People's Republic of China. At least initially, existing superpower nuclear forces would exceed the level required for reprisals. Over time, however, effective nonproliferation strategies and negotiations might even reduce the size of those and other nuclear arsenals, thereby allowing the superpowers to make further reductions.

Small reprisal forces built around systems unsuitable for surprise attack reduce the risk of nuclear war. They alone provide proof that hostile will is diminished, that the superpowers are sincere in their declarations that the threats posed by weapons of mass destruction must be reduced, that a nuclear war cannot be won, and that a nuclear war must not be fought. Absent the ready recourse to large numbers of prompt-launch nuclear weapons, crisis stability is enhanced—especially if combined with conventional force reductions and a joint antimissile defense system. Likewise, small, bomber-heavy reprisal forces may invalidate the fear of "decapitation" strategies for war initiation by rendering such strategies unexecutable. And finally, small reprisal forces make very poor "signaling" devices, concomitantly reducing the grave risk that signals might be misread during tension or crisis.

It took the world four decades to arrive at the present levels of nuclear arms. It is not unreasonable to expect that it might take nearly that long to evolve to reprisal forces. The greatest peril exists during the first few years of the confidence-building era. Yet even that peril is small when compared to the risks accepted by maintaining the large and capable nuclear forces that exist today. Although small reprisal forces seem to be the best choice (if large reductions are an authentic goal), the issue nonetheless remains a matter of choice. The transition will not be easy or risk-free, but it can be managed safely.

Beyond the Culminating Point

FORMER SECRETARY of defense James Schlesinger, quoted at the beginning of this essay, correctly describes the difficulties associated with the transition to a new era. However, given as we are the choice between the horror of employing nuclear weapons or the discomforts associated with building more stable relationships in an era of deliberately pursued peace, the discomforts are tolerable.

If they choose to do so, the United States and the Soviet Union can move from separate architectures for collective defense to joint arrangements promoting collective security. Arms control has become essential for collective security. An arms-control regime predicated on a shared vision of the role of nuclear weapons is apt to be more effective and durable than one predicated on separate beliefs that nuclear wars may be successfully fought.

Arms control—particularly the measured and progressive reduction of

arms down to reprisal force levels—is neither the abdication of our responsibilities as a world leader, nor total disarmament. Rather, it signals the willingness of both sides to accept a permanent and guaranteed nuclear armistice as an alternative to brute force deterrence and brute force diplomacy.

By rejecting nuclear arms as legitimate adjuncts to political intercourse, the superpowers could notify the rest of the world that they had stripped nuclear arms of their deterrence value. The relatively small nuclear forces of the United Kingdom, France, and the People's Republic of China already appear to be better suited for reprisals than for anything else. The example set by the superpowers would not provide a sufficient guarantee that nuclear proliferation would cease, but it would likely provide more inhibitions than endorsing nuclear force by constantly improving superpower nuclear arsenals. *Perestroika* provides the opportunity to restructure our relations not only with the Soviet Union, but with the rest of the world as well. In so doing, we could jointly restructure our nuclear forces to diminish whatever threats we believe they pose to our own security, to the planet, and to the people who dwell on it.

In the final analysis, maintaining large numbers of nuclear weapons is unnecessarily dangerous and costly. The principal utility nuclear weapons appear to have is for threatening reprisals against a nation foolhardy enough to use them. Together the United States and the Soviet Union can diminish the threat. This is the new condominium that could emerge from finding a shared vision at the culminating point. This could be, and perhaps ought to be, the essence of any SIOP for *perestroika*.

Notes

1. The emergence of *perestroika* signals the success of over four decades of containment and heralds the beginning of the postcontainment era. We have the opportunity to shape this postcontainment world. In doing so, it is imperative to keep in mind that although *perestroika* is largely driven by economics, its intent is to increase Soviet power in the aggregate and over the long term. Successful democratization and economic reform will complicate nuclear attack planning. Democratization in Eastern Europe, for example, may result in the withdrawal of Soviet forces or the demise of the Warsaw Treaty Organization. But a large Soviet military infrastructure (airfields, caserns, and so forth) remains. This alone will mandate an increasingly adaptive SIOP. Successful economic reforms, while appearing benign on the surface, will increase the number of potential economic and industrial targets. Manufacturing facilities could grow in number and be served by more sources of raw or partially finished materials. The transportation infrastructure will expand to improve distribution of materials and goods but will also increase military mobility. Joint economic ventures provide the opportunity to improve the means of producing military equipment, to improve technology, and to circumvent technology-transfer restrictions. Altogether, *perestroika* complicates rather than simplifies the war-planning task. Thus, it is in our best national interest to structure a postcontainment world much less dependent on nuclear arms for national security.

2. Mikhail Gorbachev, *Perestroika: New Thinking for Our Country and the World* (New York: Harper & Row, 1987), 254.

3. Office of the President, *National Security Strategy of the United States* (Washington, D.C.: Government Printing Office, 1990), 16, cites additional "arms control accomplishments of the past twelve months."

4. Gerald Segal et al., *Nuclear War and Nuclear Peace*, 2d ed. rev. (New York: Saint Martin's Press, 1988), 163.

5. *Kommunist*, March 1986, 131, quoted in F. Stephen Larrabee, "Gorbachev and the Soviet Military," *Foreign Affairs* 66, no. 5 (Summer 1988): 1007. This mandate suggests that "purely defensive" doctrine replace some less pure or less defensive existing or pre*perestroika* doctrine.

6. Statement of the president, in "Press Conference with Mr Mitterrand, December 16, 1989," *Weekly Compilation of Presidential Documents* 25, no. 51 (25 December 1989): 1967.

7. Mikhail Gorbachev, "Gorbachev and Bush Exchange New Year Addresses," *The British Broadcasting Corporation Summary of World Broadcasts*, 3 January 1990, LEXIS/NEXIS, pages not numbered.

8. Statement of the president, in "New Year's Message to the People of the Soviet Union, January 1, 1990," *Weekly Compilation of Presidential Documents* 26, no. 1 (8 January 1990): 1.

9. Congressional Budget Office, *Modernizing U.S. Strategic Offensive Forces: The Administration's Program and Alternatives* (Washington, D.C.: Government Printing Office, 1983), 22, 84–91; see also Francois Heisbourg, *The Military Balance 1989–1990* (London: International Institute for Strategic Studies, 1989), 212; Mark S. Hoffman, ed., *The World Almanac and Book of Facts 1990* (New York: Pharos Books, 1989), 790; and Thomas B. Cochran et al., *Nuclear Weapons Databook*, vol. 2, *US Nuclear Warhead Production* (Cambridge: Ballinger Publishing Company, 1986). Not every weapon in the Soviet and United States strategic offensive force arsenals may be deliverable. See note 26 below.

10. Carl G. Jacobsen, *The Nuclear Era: Its History, Its Implications* (Cambridge: Oelgeschlager, Gunn and Hain, Inc., 1982), 109.

11. Department of Defense, Office of the Under Secretary of Defense for Acquisition, *Arms Control, Particularly Strategic Arms Reduction: Process and Prospects*, Washington, D.C.: January 1990, 6.

12. Ibid., 7. Current START negotiations will limit both sides to 1,600 delivery vehicles carrying no more than 6,000 accountable warheads. Under the 6,000 limit, there is a sublimit of 4,900 warheads on ballistic missile systems.

13. Molly Moore, "Aspin: Weapons Too Costly to be Bargaining Chips," *Washington Post*, 7 February 1990, 5.

14. The current START proposal gives bombers another advantage: each heavy bomber counts as one delivery vehicle against the 1,600 limit, regardless of the number of nuclear weapons it carries. Heavy bombers which do not carry cruise missiles count as one warhead against the 6,000-warhead limit. For heavy bombers carrying cruise missiles, each cruise missile attributed to each bomber counts as one warhead against the 6,000 limit.

15. Some disagree. See Gary L. Guertner, "Strategic Arms after Reagan: The Unfinished Agenda," *SAIS Review* 10, no. 1 (Winter–Spring 1990): 87–100; Michael E. Brown, "The U.S. Manned Bomber and Strategic Deterrence in the 1990s," *International Security* 14, no. 2 (Fall 1989); William W. Kaufmann and Lawrence J. Korb, *The 1990 Defense Budget* (Washington, D.C.: Brookings Institution, 1989), 26–29; Jack Beatty, "A Post–Cold War Budget," *Atlantic Monthly*, February 1990, 74–82; and Lars-Erik Nelson, "Peace or No Peace, Air Force Is Not About to Jettison the B-2," *Orlando Sentinel*, 14 March 1990, A-10.

16. Aaron L. Friedberg, "A History of U.S. Strategic 'Doctrine'," *Journal of Strategic Studies* 3, no. 3 (December 1980): 65.

17. Brent Scowcroft, "Current Problems in Nuclear Strategy and Arms Control," *Essays on Strategy and Diplomacy* (Claremont McKenna College, Calif.: Keck Center for International Security Studies, 1984), 6.

18. *The United States Strategic Bombing Survey: Summary Report (Pacific War)* (Washington, D.C.: Government Printing Office, 1946; reprint ed., Maxwell AFB, Ala.: Air University Press, 1987), 106–7.

19. Congress, Office of Technology Assessment, *The Effects of Nuclear War* (Washington, D.C.: Government Printing Office, 1979), 109–15; Dennis M. Drew et al., *Nuclear Winter and National Security: Implications for Future Policy* (Maxwell AFB, Ala., Air University Press, 1986), 27; and Christine Cassel, Michael McCally, and Henry Abraham, eds., *Nuclear Weapons and Nuclear War: A Source Book for Health Professionals* (New York: Praeger Publishers, 1984), 89–236, 519–40.

20. Bernard Brodie et al., *The Absolute Weapon* (New York: Harcourt, Brace & Co., 1946), 76, and *The United States Strategic Bombing Surveys: Summary Report*, (Maxwell AFB, Ala.: Air University Press, 1987), 119.

21. Cited in Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, N.Y.: Cornell University Press, 1989), 1.

22. Herman Kahn, *On Thermonuclear War*, 2d ed. rev. (Princeton: Princeton University Press, 1969), xxi–xxiv.

23. Guy B. Roberts, "The New Rules for Waging War: The Case against Ratification of Additional Protocol I," *Virginia Journal of International Law* 26, no. 1 (Fall 1985): 139–51; see also Harry H. Almond, Jr., "Nuclear Weapons Are Legal Tools," *Bulletin of the Atomic Scientists*, May 1985, 32–35.

24. Senate Committee on Foreign Relations, *Nuclear War Strategy, PD-59*, 96th Cong., 2d sess., 1980, 4:26–27.

25. Reprisals must be designed to be terrible in order to deter with as few weapons as possible. A 300-megaton limit (with numerical sublimits on warheads and delivery vehicles) could constitute an effective reprisal. Attacks against military or leadership targets in urban areas (including the capitals of republics, *oblasts*, and *krays*) and attacks against Soviet nuclear power plants are all candidates. See Bennett Ramberg, *Nuclear Power Plants as Weapons for the Enemy: An Unrecognized Military Peril* (Berkeley: University of California Press, 1985), 71–82.

26. Desmond Ball, "Development of the SIOP, 1960–1983," in *Strategic Nuclear Targeting*, ed. Desmond Ball and Jeffrey Richelson (Ithaca, N.Y.: Cornell University Press, 1986), 80–81. Ball cites a SIOP targeting array of 5,419 targets for alert forces and 8,757 targets for generated forces, allocated by the target categories of nuclear, other military targets, leadership, and economic and industrial installations. Analysis of Ball's data yields these weights of effort:

Target Category	Alert Targets	Percent of Total	Generated Targets	Percent of Total	Change
Economic & Industrial	2,300	42	4,400	50	+2,100
Other Military	935	17	1,603	18	+ 668
Leadership	423	8	736	9	+ 313
Nuclear Force	1,761	33	2,018	23	+ 257
Total	5,419		8,757		+3,338

Note that economic and industrial targets account for 63 percent of the total growth when moving from the alert to the generated case.

27. Office of the President, *National Security Strategy*, 2, 22–24; and Office of Secretary of Defense, *Report of the Secretary of Defense Frank C. Carlucci on the FY 1990/FY 1991 Biennial Budget and FY 1990–94 Defense Programs* (Washington, D.C.: Government Printing Office, 1989), 34–37.

28. Stephen J. Cimbala, *Nuclear War and Nuclear Strategy: Unfinished Business* (New York: Greenwood Press, 1987), 245, suggests that "parity" formulas must "confront differences between the superpowers in geopolitical objectives, perceived threats, alliance commitments, and national strategic cultures."

29. START counting rules will not result in a 50-percent reduction in warheads; rather, they result in a 50-percent reduction in aggregate Soviet missile throw-weight and heavy missiles.

30. The need for a unilateral strategic defense system to destroy intentionally launched Soviet ballistic missiles in flight is less compelling now than it was in 1983. Space-based "kill" vehicles would destabilize superpower relations by introducing fundamentally new technologies that would greatly enhance one side's nuclear attack capability. A joint United States–Soviet Union SDI, however, would help stabilize relations as we move beyond containment. Such a system would also facilitate significant reductions in ballistic missiles. A marriage of United States technology and Soviet lift would capitalize on the strengths of both countries. If reprisal were accepted as the role of nuclear forces, the Soviets could perhaps avoid a $200–$400 billion investment in antistealth air defenses, investing some of this money in their share of a joint SDI system instead. Soviet antistealth costs are described in John W. R. Lepingwell, "Soviet Strategic Air Defense and the Stealth Challenge," *International Security* 14, no. 2 (Fall 1989): 94.

31. The more likely third-world nuclear threat against the United States is probably a weapon entering by container ship and detonating in port or en route across the country. While this class of threat persists, ballistic missile proliferation will add the potential threat of third-world missile attacks against China and Japan, some parts of the USSR, and United States overseas interests; and against nations in Europe, the Middle East, and South America. A multinational SDI to engage accidental or unauthorized armed launches (from the United States, the USSR, China, the United Kingdom, France, and from broad ocean areas), errant test launches, and third-world attacks would provide significant advantages to participating nations. The opportunities a multinational SDI system offers cannot be exploited until we advance beyond the notion of nuclear war fighting. For a description of countries pursuing ballistic missile capability, see Arthur F. Manfredi, Jr., et al., *Ballistic Missile Proliferation Potential in the Third World*, Library of Congress Report no. 86–29 (Washington, D.C.: Congressional Research Service, 1986), 1–41.

32. Thomas L. Freidman, "Baker Braves the Gauntlet in the Moscow Parliament," *New York Times*, 11 February 1990, 14; see also Michael Wines, "C.I.A. Says a Gorbachev Removal Is the Sole Threat to Soviet Change," *New York Times*, 2 March 1990, A4.

33. Strategic forces (as a major force program in the Department of Defense budget) consumed an average of $22 billion a year (less than 8 percent) over FY 1986–90 compared to an average of about $115 billion (about 40 percent) a year for general-purpose forces. Thus, existing strategic forces are not the "cash cow" those looking for a "peace dividend" expect. The savings and loan "bailout"—by comparison—is now expected to cost the American taxpayer somewhere between $400 billion and $1 trillion over the next several decades.

34. James V. Neel, Gilbert W. Beebe, and Robert W. Miller, "Delayed Biomedical Effects of the Bombs," *Bulletin of the Atomic Scientists*, August 1985, 73–75; and House Subcommittee of the Committee on Government Operations, *Hearings on Civil Defense: 1962, Part II*, 87th Cong., 2d sess., 1962, 468–513.

35. Congress, Office of Technology Assessment, *Effects of Nuclear War*, 94; Ball, "Development of the SIOP," 75; William H. Daugherty, Barbara Levi, and Frank N. von Hippel, "The Consequences of 'Limited' Nuclear Attacks on the United States," *International Security* 13, no. 2 (Spring 1986): 27; Barbara G. Levi, Frank N. von Hippel, and William H. Daugherty, "Civilian Casualties from 'Limited' Nuclear Attacks on the USSR," *International Security* 13, no. 3 (Winter 1987-1988): 169; and Michael M. May, George F. Bing, and John D. Steinbrunner, *Strategic Arms Reductions* (Washington, D.C.: Brookings Institution, 1988).

36. Ernest A. Bondietti, "Effects on Agriculture," in *Nuclear War: The Aftermath*, ed. Jeannie Peterson (New York: Pergamon Press, 1983), 129. See also note 19 above.

37. Office of the President, *National Security Strategy*, 15–16, cites four "fundamental criteria" for judging arms control. Agreements must: (1) add to US security by reducing Soviet attack incentives and promoting stability; (2) lead to better predictability in "the size, nature, and evolution" of forces; (3) be

verifiable; and (4) "not compromise allied security." Small reprisal forces—with greater reliance on bombers and constraints on alert and missile forces—appear to meet all four criteria.

38. Acceptance of a reprisal based approach to deterrence on both sides is necessary to make very large reductions. The present SIOP—with all the complex "building blocks," "withholds," and "reserves" described by Ball in "Development of the SIOP"—deters by planning to employ a large number of weapons in an attempt to deny the Soviets their war aims. Yet, should deterrence fail, attempts at denial would not make the outcome of an exchange any more tolerable. On the other hand, with reductions below a certain number of weapons, denial must become punishment. Our choices are to remain at a high floor to preserve some semblance of our present deterrence theory and SIOP, or accept a reprisal based approach to deterrence and the punitive SIOP that results. Since *perestroika* could signal a fundamental change in the calculus of security, we have much to gain by challenging the Soviets to join us in reducing nuclear forces to an absolute minimum. If they agree, massive reductions can be made. If they do not, it is best to know it now. We should not wait until 1998 when the START decrement must be completed.

Essay 4

Theater Nuclear Forces and Extended Deterrence in a Multipolar World

by

Maj David L. Booker

Introduction

THE DESTRUCTIVE power of nuclear weapons, detonated in anger for the first and only time 46 years ago, has created what is frequently termed the nuclear "paradox," the essence of which is that nuclear arsenals exist to preclude their ever being used.[1] While strategic nuclear weapons may be seen as a necessary guarantee against political domination (or worse) by a nuclear-capable superpower rival, theater nuclear forces (TNF) have occupied a less well-defined position in the United States' scheme of deterrence.[2] On one hand, TNF, whether in the employ of the United States or its allies, the Soviet Union, or other—possibly less responsible—parties represent the most direct route down what Gen Bernard Rogers has termed the "slippery slope," or escalation path, to general nuclear conflict. On the other hand, TNF have been for several decades the linchpin in a European security system which appears to have successfully forestalled Soviet attempts at regional hegemony.

However, the apparent reduction in Soviet theater power-projection capabilities in recent years has eroded whatever face value that theater nuclear weapons (TNW) may have acquired in an earlier, more confrontational era of superpower relations. The watershed changes in global affairs, coupled with the discomfort felt by many in the United States and allied defense communities at our seemingly inordinate reliance on the deterrent power of TNW, have called into question the need for any nuclear weapons capability short of the ability to deter a direct nuclear attack on the United States itself.

Can these weapons and the strategic nuclear agenda that they came to serve now be properly laid to rest? For a number of reasons, geopolitical circumstance militates against prematurely discounting the deterrent value of theater nuclear weapons or the crisis management options that they might afford US strategists. Several of the same factors likely to drive US choices as to general strategic direction in the coming years argue as well for retaining a discrete range of nuclear warfare capabilities, beginning with those at the lower end of the spectrum of possible nuclear options. The matrix of possibilities created by such factors might provide useful insights into the types of force structures and nuclear policy options that could effectively serve future US security interests. A concluding section offers a qualified appraisal about what the future might hold for theater nuclear forces.

From a purely philosophical standpoint, the question of what to do about theater nuclear weapons seems relatively straightforward in light of present trends in the global security environment: given the dire promise of such weapons, their continued presence in the US (or any other nation's) inventory should not be condoned since they no longer (if they ever did) serve a clear, immediate, or convincing purpose.[3]

However, even when considering the negative marginal utility of such weapons, the problem is not quite that easy to resolve. TNW occupy their niche in the pantheon of military capabilities because of a number of interrelated cultural, political, technological, and military factors that have dominated the strategic calculus of the nuclear age. Four variables, in particular, are likely to figure prominently in strategic choices of

weapons, including the theater nuclear variety. Key factors include: first, and most obvious, the kind of global order (or disorder) most likely to supplant the superpower competition of the past 45 years; second, ways in which strategic objectives will be defined in this new international arrangement, particularly given the resource gap that exists between optimizing strategies and supporting means; third, the extrinsic utility of various kinds of modern weapons (i.e., the perceived capabilities of nuclear as opposed to advanced conventional weapons for achieving desired effects on enemy forces and infrastructures); and fourth, the implications of extending the threat of armed force (of any type, but especially at the nuclear level) beyond the immediate pale of national (i.e., territorial) defense.[4]

Many of the strategic perplexities created by theater nuclear weapons—including their deterrent credibility in peacetime as well as how they should or would be used should deterrence fail—are not easily quantifiable. The interaction of diverse strategic cultures and possible differences in perceptions of nuclear weapons as useful instruments of denial or coercion complicates both arms control and force planning calculations involving TNF. Though treated sequentially, the concerns described below cannot be considered independently of one another; environment, culture, perception, capability, and resulting behaviors are part and parcel of the same strategic equation.

The Evolving International Security Environment

FOR MOST Americans who are accustomed to the chill of the decades long ideological and military competition between the United States and the Soviet Union, the current watershed in world affairs contains Janus-like possibilities that are simultaneously alluring and disconcerting. On one hand, existing opportunities to redirect American resources from defense to meet other fundamental national needs have not appeared as great since 1945; one writer has termed current changes in the Soviet Union and elsewhere "the postponed end of World War II."[5] On the other hand, while the Soviet Union is undergoing profound political, ideological, and structural change, it retains its military capabilities (conventional and nuclear), which are equivalent to those of the United States; the Soviet Union is, in fact, continuing to modernize nuclear and conventional forces amidst uncertainty about its future place in the European and international systems. Further, regional conflicts continue to disrupt an increasingly interdependent international system, exacerbated by an expanding market for advanced electronics, propulsive, electromechanical, and other weapons technology systems, including those necessary to fashion nuclear devices. Latent global insecurities increase when the power attributes of nations are overlaid by diverse cultural perspectives (to include divergent views of just and unjust wars and what constitutes the permissible use of force), ethnic and religious differences within and between states, competing territorial and economic interests, and the ubiquitous concept of sovereign rights.[6] In many respects, what might follow in the wake of the cold war could be as problematic for Western policymakers as the aftermath of World War I was for liberal-political theorists who dreamed of the permanent abolition of power politics:

> All believed that responsibility for the war rested very largely with the militaristic ideology rooted in the quasifeudal monarchical social order in Central Europe whose destruction had removed a serious obstacle to world peace. What was harder for them to appreciate was that the destruction of that order would . . . create a

> vacuum to be filled by warring forces of revolution and counter-revolution out of which regimes would arise far more ferocious than those they had replaced—regimes even less susceptible to reason or enamoured of an order based on consent.[7]

As the Persian Gulf conflict of 1990–91 illustrates, the postcontainment world might well be fraught with perils approaching those (excepting the threat of global nuclear war) found in our erstwhile competition with the Soviet Union. This is due, in part, to the proliferation of nuclear weapons-related technologies and the advanced means for delivering weapons of mass destruction. To sense the full significance of such developments, one need only consider the dimensions of the problem posed to the United States and its allies if Iraq indeed had possessed nuclear warheads to fit its Scud missiles. Taken one step further, what would have been the strategic options in the Persian Gulf if the US military had been the size in 1991 it was budgeted to be in 1996 and if Saddam Hussein had displayed a better appreciation of military art and statecraft?

Future Choices

Strategic Ends and Means

IF STRATEGY is the art of applying military technology to achieve desired ends, the institutionalized beliefs of policymakers about what is desirable (state of affairs), acceptable (courses of action), and probable (scenarios, consequences) constitute the looking glass through which strategic alternatives must pass for decision.[8] As Colin Gray maintains, if there is such a thing as national strategic culture (i.e., unique "modes of thought and action with respect to force"), understanding one's own strategic perspectives and those of others would seem to be an essential prerequisite to developing effective nuclear weapons and defense policy.[9]

Worldviews and Strategic Vehicles

UNITED STATES strategic views stipulate that we prosecute so-called unlimited wars (such as the First and Second World wars) with complete fervor, while we struggle to sustain flagging popular support during conflicts conducted for more limited (or less politically clear-cut) objectives.[10] Further, the style of American warfare reflects specific national preferences, both in strategies and in operational method:

> The ability to produce and field sophisticated weapons that provide great firepower combined with the tradition of overwhelming our enemies has produced a significant trend in twentieth-century American military technique. Modern American strategists and tacticians have sought *to substitute fire and steel for American blood.* Strategic bombing in World War II was an attempt to find a way to victory that would minimize American bloodshed.[11]

Such palpable American impatience with protracted conflict for other than absolute objectives (e.g., the total overthrow of world-threatening fascist-militarist dictatorships) and a corresponding affinity for the decisive application of combat power to avoid a protracted conflict raise a key question for US strategists: Absent the threat of a bilateral nuclear exchange, to what level of violence would the United States be willing to carry localized conflicts to secure allied interests at the lowest possible cost in blood and treasure? A partial answer might lie in the recent statements of senior US military officers and analysts and other officials at the Defense Department that the key to a rapid and minimum-cost Persian Gulf campaign against Iraq lay in employing

air power to the fullest extent possible within existing political and strategic constraints.[12] While this could mean heavy attacks on economic, political, and logistics infrastructures as well as on military forces in advance of a ground offensive, it obviously begs for more extreme possibilities, such as the use of nuclear weapons to break a protracted and costly conventional deadlock or to end hostilities against a future adversary who possesses nuclear, bacteriological, or chemical weapons. Would the nuclear threshold in such situations be as inviolate as is commonly supposed, given traditional US strategic values and attitudes?

Viewed from another angle, what we commonly perceive to be absolute limits—either as to the nature of deterrence or actual levels of destruction in warfare or even acceptable loss rates—might have a decidedly different meaning to those who are possessed of different worldviews, traditions, and experiences. Bernard Brodie's observation that "good strategy presumes good anthropology and sociology" requires careful reflection, as does the idea that American policymakers might have transferred their own concepts of nuclear war and the nature of deterrence to others (i.e., the Soviets) who did not really share the same perspectives.[13]

Weapons and Military Roles

Some Difficulties

At the grand strategic level, defense priorities are based on perceptions of security goals and threats for which less abstract measures of merit (such as force size or performance characteristics) are adequate only to a point. For example, each of the several different levels of US nuclear thought, ranging from declaratory to force development and employment policy, addresses different dimensions of the same overall strategy. Policymakers and planners sometimes approach the issue of deterrence and military preparedness from decidedly different perspectives.[14] Consequently, it should surprise few observers that theater nuclear weapons have held considerable appeal as "lower-order" instruments of deterrence while they have simultaneously prompted significant concern about the escalatory risks entailed.

Military Technology and Resource Availability

Beyond the difficulty of subjectively defining threat as opposed to adequate response lies a second problem involving ends and means. Since other national (nondefense) priorities occasionally make urgent and legitimate calls on our resources, perennial concerns over feasible defense strategies assume even more critical proportions:

> With regard to these global responsibilities, U.S. forces are obviously not available to defend everywhere against every threat at all times. . . . Because our current forces are insufficient to take on all tasks simultaneously, general strategic priorities and the specific circumstances and forces available at the time will govern force employment.[15]

As the immediate military pressures of the cold war recede, and political sentiment for a US defense retrenchment mounts, a variety of strategic options for securing future US global security interests has emerged (or resurfaced, in the case of the Air Force's "Global Reach" projection of forward-deployed and long-range strategic air power).[16] Common to such visions of the strategic future of the United States are the tacit concessions that the United States will possess unlimited resources to procure its objectives and that advanced weapon system technologies will provide US forces with an affordable ability to win future conflicts quickly and decisively. Such projection

strategies usually envision the limited availability of forward basing that is provided by allies who are in close proximity to potential areas of operation.[17]

Nuclear Weapons

Effects and Applications

AT LEAST from the standpoint of the Western world, nuclear weapons must be considered first and foremost political instruments whose overriding purpose is the aversion of conflict. However, observers must also consider nuclear forces as weapons in the operative (or purely functional) sense to fully appreciate either the costs that they threaten to impose on the enemy in the name of deterrence or their siren-song to nations having vastly different perceptual frames of reference about what constitutes effective military power. Consequently, to understand the larger political purposes that particular classes of nuclear weapons might serve, it is not sufficient to dismiss the inquiry with the generic categorization "nuclear." The need to assess the operational and strategic implications of nuclear weapons is particularly acute in view of what is to some observers an increasingly blurred distinction between, on the one hand, types of nuclear weapons which produce relatively low-order "tailored" effects and, on the other, advanced conventional munitions.[18]

"Intrinsic/Extrinsic" Nuclear Effects

From the standpoint of pure physical effect, the operational implications of nuclear detonations would be relatively straightforward—and negative, in terms of functional disutility—were it not for the fact that nuclear effects can be tailored to achieve specific results. Thermal, initial, and residual radiation effects are more problematic than those due to blast because they are subject to a greater number of intervening variables such as the degree of protection afforded to forces and their equipment in the vicinity. While the probability of kill from such effects would be approximately 100 percent for unprotected personnel and equipment at or adjacent to the point of detonation, this probability becomes secondary to blast (and particularly overpressure) as the distances increase from ground zero. However, greatly increased lethal effects from the initial nuclear radiation are possible by minimizing the fission yield of a weapon relative to its fusion yield (also achieved, in part, by substituting non-uranium tampers).[19] Such a weapon—variously termed enhanced radiation, reduced blast, or neutron bomb—can deliver lethal doses of neutron and gamma radiation to about twice the distance as fission devices of comparable yield. This weapon can also deliver roughly the same amount of radiation as fission weapons having 10 times the explosive yield.[20] These explosive yield scenarios illustrate the possibility of reducing blast, thermal, and residual radiation effects by greatly decreasing the weapons yield required to produce intense doses of prompt radiation. Research is also under way to determine the explosive yield of other types of tailored effects weapons, such as suppressed radiation devices (enhanced blast effects with reduced neutron radiation) and induced radiation weapons (increased contamination from initial radiation, for temporary area denial).[21]

Three points emphasize the intrinsic effects of nuclear weapons. First, regardless of their generic properties (the release of radiation, intense thermal energy, and

explosive power producing blast), nuclear weapons can produce an extremely broad range of direct and indirect effects. Stripped of such fundamentally important but collateral concerns as the dangers of escalation frenzy, atmospheric contamination, and nuclear winter, single or limited numbers of nuclear weapons produce effects that—while they might defy moral, political, or even operational logic—are at least comprehensible and quantifiable.[22] Second, regardless of the potentially significant ecological hazards that result from surface or air bursts, the immediate results of low-order nuclear detonations can be discriminate: people, equipment, and structures at varying distances from ground zero can, with proper preparation, survive to operate in a nuclear environment.[23] Finally, the effects produced by a nuclear detonation *can be* far more intense over far greater areas than those achieved by nonnuclear munitions (one possible exception will be discussed later). Whether the net operational benefit of constrained nuclear effects is real or dangerously illusory, the fact remains that decisive operational advantage could be seen in the limited (or concentrated) employment of nuclear weapons.

Net Effects

Low-Order Nuclear Versus Advanced Conventional Weapons

Given nuclear weapons' obvious liabilities—military and political—is there a position at which the nuclear point of focused (or militarily useful) destruction intersects that of evolving/emerging conventional munitions capabilities? While it might seem as pointless to compare relative effects of nuclear and conventional weapons as it is to draw parallels between the eating habits of sharks and giraffes, the distinction between the two might prove more artificial than absolute for a number of reasons.

First, the traditional operational measure of merit in ordering combat priorities has been the enemy's ability to further his military and political objectives while frustrating our own. The operational planning process attempts to assign systems and warheads offering the highest probability of prompt kill against enemy forces and/or systems presenting the greatest potential danger to vital friendly forces or installations.[24] The US single integrated operations plan represents probably the most extreme instance of threat prioritization according to risk, involving as it does enemy forces that pose the most direct and immediate nuclear hazard to the United States or its allies. At lower levels of conflict, field commanders who seek to seize the operational initiative from an enemy will try to neutralize those forces or weapons systems most likely to impede a swift and effective operation.

Unfortunately, those who would draw clear distinctions between operational and strategic necessity in target choices and tactical ballistic missiles, along with advanced long-range aircraft with stand-off launch capabilities and other deep-reach weapons systems, have stood such distinctions on their head. The spectacle of intensive allied search-and-destroy air operations against Iraqi mobile Scud missiles at the outset of the Persian Gulf conflict effectively discounts the notion that political, strategic, and operational considerations are somehow separable in modern warfare. As the definition of significant military threat has changed with technological advances in delivery systems, concepts about the types of force necessary to counter such threats appear to be undergoing a corresponding transformation. That the perceived need begets the chosen means is evidenced by the fact that chemical weapons production facilities located in heavily populated sections of Baghdad were deemed crucial enough a threat to warrant surgical

cruise missile and tactical air strikes. While the particular means chosen to implement Operation Desert Storm were purely conventional, the open-ended problem of targeting threats having both operational and strategic possibilities encompasses a broader range of possibilities than those represented by specific weapons systems. As a consequence, the United States refused to unequivocally rule out other types of responses, including the use of chemical or nuclear weapons, throughout the conflict.

A second reason for not embracing a strict dichotomy between low-yield nuclear weapons and their conventional alternatives lies in the targeting itself. Not all targets are created equally in terms of susceptibility to damage from particular types of weapons. Technically, a target is defined by its relative hardness, degree of surface exposure to direct weapons effects (i.e., subterranean structures might experience only the shock transmitted by an explosive detonation on the surface above), and the extent to which its constituent elements are dispersed. Where 2,000-pound laser-guided bombs might be ideal for bridges or ammunition storage sites and conventional cluster munitions might be suitable for troop concentrations or airfields, neither weapon provides the precise effects necessary to neutralize hardened missile silos or large, mobile-armored formations operating in relatively open terrain.

Third, specific weapons effects might be required for targets that are inaccessible to direct impact, are dispersed and mobile, or are so situated that they pose a high risk of attrition to attacking forces. While precision-guided conventional munitions have appreciably reduced the amount of high explosives required to significantly damage specific kinds of targets, they could require specialized capabilities to destroy other types of targets.

Finally, distinctions between weapons effects become somewhat gray when one examines the trade-off between weapon delivery accuracy and the desired probability of damage to particular targets. Precision-guided munitions have noticeably affected the calculations of targeting staffs and commanders alike by greatly improving probabilities of damage through vastly increased delivery accuracy (measured in terms of circular error of probability [CEP] and defined as the radius from the center of a target within which one-half of the delivered weapons can be expected to fall). Such accuracy has reduced the number of launches, sorties, or rounds necessary to effect the destruction of even small, hardened point targets.[25] At the same time, the benefits of improved delivery accuracies have been partially offset by size-of-payload restrictions that effectively limit the conventional explosive potential for most munitions to what can be effectively packed into a warhead or carried aboard a delivery vehicle. Consequently, the effects of such weapons, while formidable for many types of targets, might not produce the power (in a single weapon) necessary to neutralize certain types of targets, as evidenced by the United Nations' (UN) decision to carpet bomb Iraq's Republican Guard formations by using B-52s to carry large numbers of general purpose bombs. As a result, large numbers of high-explosive conventional weapons might be required to service particular types of targets. A proportionate amount of collateral damage is usually the inevitable result. There is a certain irony in the observation that low-yield nuclear weapons designed to maximize certain effects might, in fact, offer smaller risk of unwanted destruction (i.e., outside of the target area) than the mass employment of conventional munitions:

> In essence they (tailored effects nuclear weapons) are different weapons because they seek to exploit, or restrict, different weapons effects. These differences spell out a pattern of tactical nuclear warfare in which it becomes possible to fulfill military needs in a manner that hardly conforms to the dominant image of widespread destruction and contamination. Furthermore, and perhaps even more revealing of persistent shibboleths, differences between these weapons and conventional weapons indicate that conventional warfare may not be as relatively virtuous as many presently believe.[26]

Such views beg the obvious problem of having target arrays dispersed over large geographic areas that might require significant numbers of low-yield nuclear weapons to cover all target elements (such as maneuver battalions operating in a fluid battlefield environment). In such cases, the operational benefits of tactical nuclear weapons could well be offset by concerns over aggregate amounts of radiation and other side effects produced by a large number of nuclear detonations.

Regardless how closely certain types of low-order nuclear weapons and advanced conventional weapons approach each other in terms of physical effect and relative destructive capability, the specter of tactical nuclear warfare continues psychologically to influence current doctrines for high-intensity conventional operations.

Modifications in Force Design and Operational Practice

The distinct threat posed by theater nuclear weapons to conventional forces and their supporting infrastructures has had a significant impact on how those forces have prepared to do battle. For example, Soviet military doctrine has long recognized the potential for operations on the nuclear battlefield. It has given considerable attention to such concepts as smaller and more highly mobile ground maneuver elements, echelonment of primary, follow-on forces to produce high-tempo operations leading to rapid closure with enemy forces, dispersal of ground force units in columns of march or when deployed for battle, and the urgent need to neutralize enemy tactical nuclear weapons capabilities at the earliest possible opportunity.[27] While the concept of the nonlinear battlefield of the future is mostly an offshoot of quantum advances in the scope, range, mobility, and killing power of conventional weaponry and supporting systems, it has been influenced in no small measure by the expected effects of tactical nuclear warfare.[28] According to a 1985 statement by the assistant secretary of defense for atomic energy:

> The presence of a potent SNF (short-range nuclear force) on the battlefield causes an attacker to choose between dispersing his forces in order to avoid presenting a lucrative nuclear target or (inviting) catastrophic destruction by keeping them massed. An attacker who prefers mass, but who has been forced to disperse has his forces deployed in a way that decreases their effectiveness, and slows the momentum of the attack. This situation, in turn, causes a recalculation of the probability of successful attack, and the reduction of that probability is what will cause an aggressor to be deterred.[29]

Battlefield operational doctrine is but one of a number of areas of strategic and operational thought affected by the existence of theater nuclear weapons. Given that TNW possessing varying range limits can essentially hold at risk an entire spectrum of enemy war-fighting and war-sustaining capabilities (up to and including homeland-based assets), it is not surprising that these weapons have come to personify a sort of ultimate military center of gravity in both the NATO and Warsaw Pact ways of thinking.[30] Consequently, much thought has gone into dealing with the enemy's ability to employ such weapons (as well as chemical and biological agents) against supporting infrastructures as well as military forces and to devise credible means for threaten-

ing the enemy's support systems across the board.[31]

Extended Deterrence
Meanings and Implications

WHILE THERE are numerous variations on the theme of deterrence, many of which are cleverly couched in motive behavior—denial, talionic (or "eye for an eye"), and reinforceable—extended, conventional, or nuclear deterrence hinges on a more pragmatic notion. That is, the promise of punishment beyond the value of the gain sought or outright denial of military objectives will dissuade potential aggressors from attempting to take that which appears to be within their means. However, as is the case with deterrence in its more general sense, a number of qualifiers make the process of "extending" a protective threat somewhat problematic. First, what results from the overt or implied threat of armed force will depend on the situation inspiring the threatened use of a particular military instrument. Second, deterrent relationships are dynamic (i.e., subject to change over time in the calculations and capabilities of the parties involved). Third, a variety of tangible and intangible factors, physical and psychological, determine the nature of a deterrent relationship and its ultimate outcomes. Such factors complicate the attempt to "rationalize" the threat of nuclear weapons, particularly where the threat of pure retaliation (or response in kind) does not fit the circumstance (i.e., an appropriate response to Soviet conventional aggression against regional allies).

Extended Deterrence
Perils and Promises

The United States has learned over four decades as the senior partner in the North Atlantic Alliance that linking sovereign interests to those of third-party nations under the euphemism of "an attack on one is an attack on all" is a relatively convoluted process.[32] The territorial integrity or material well-being of the deterring nation is one thing. However, attempting to convince a potential aggressor that one is quite willing to risk self-immolation to preclude an attack on another coalition member, an ocean or a continent away, might be quite another. In one case the vested nature of the interest at stake is immediately self-evident, while additional evidence of commitment and intent to act on that commitment might be necessary to convincingly support less direct interests:

> The difference between the national homeland and everything "abroad" is the difference between threats that are inherently credible, even if unspoken, and threats that have to be made credible. To project the shadow of one's military forces over other countries and territories is an act of diplomacy.[33]

Apart from the attenuating effect that distance and one or more stages of political separation might have on an aggressor's ability to accept a declaration of vital interest as bona fide and actionable, attempts to extend deterrence encounter two further difficulties. First, the gulf between what is obviously a sphere of vital interest and what is declared a vital interest might make extremely difficult an accurate assessment by a potential challenger of the extending nation's real intent and capability, leading to possible miscalculation and deterrent failure. Second, an attempt to extend deterrence into an adversary's backyard may be seen by an opponent as either a distinct security threat, a challenge to his bargaining reputation, or both.[34]

The United States has gone to great lengths to underwrite the security of its more vital alliances. In the case of NATO, US security measures included the positioning of significant numbers of US

forces in the territories of alliance members, the deployment of theater nuclear weapons under unilateral control as well as under a dual-key arrangement, and an obvious connection between the wartime integrity of NATO and a possible US strategic nuclear response.[36] It is important to note the linking role that theater nuclear weapons have assumed in both the NATO strategy for theater defense and in the larger strategic relationship between the United States and the Soviet Union. Although US policy declarations of recent years have laid increasing emphasis on the concept of *conventional deterrence*, the US security strategy for Europe, up to and following the 1988 ratification of the Intermediate-range Nuclear Force Treaty, has continued to rely on theater nuclear forces as a centerpiece of the policy of graduated deterrence.[36]

Theater Nuclear Forces and Future United States Nuclear Options

Some Inferences

THE CONCLUSIONS which follow rest on several key assumptions. First, absent a "competent and sufficiently powerful authority at the international level," global affairs will continue to reflect the unique interests of individual nation-states, coalitions, or power blocs.[37] Conflicts will continue to occur in the economic, political, and, on occasion, military arenas. Second, nuclear weapons will not only continue to exist in the arsenals of the nations currently possessing them, but they will continue to be regarded as desirable, albeit dangerous, instruments of national power by aspiring regional powers. Consequently, acquisition by nonnuclear states of technologies and materials essential to the construction of nuclear devices will continue in the absence of effective international means for controlling nuclear proliferation. Third, research into advanced nuclear weapons effects will continue, as will the development (if not the mass field deployment) of so-called tailored-effects weapons. Finally, US cold war strategic perspectives that emphasize maintenance of a global status quo based on the right of self-determination will not radically change, and particularly not in ways involving a full-scale disengagement from our role as champion of global peace and stability, or a return to a new isolationism.[38] The recent US-led and UN-sanctioned operations against Iraq are indicative of the lengths to which the United States is prepared to go, particularly where its perceived vital interests are intermixed with broader, internationalist concerns.

The Logic—or Illogic—of Theater Nuclear Weapons in the "New World Order"

The meeting point of US strategic culture, perceived threats to US vital interests, and the deterrent effects of theater nuclear weapons have, for the past 40 years, been in Western Europe. Whether Europe ultimately remains the touchstone of US strategic interests vis-à-vis a reinvigorated Soviet land power is uncertain. However, recent national policy statements indicate that the United States is likely to continue in its self-appointed role as a democratic primus inter pares and to retain an active security interest in global affairs:

> In particular, for most of this century, the United States has deemed it a vital interest to prevent any hostile power or group of powers from dominating the Eurasian land mass. This interest remains. . . . As the world's most powerful democracy, we are inescapably the leader, the connecting link in a global alliance of

> democracies. The pivotal responsibility for ensuring the stability of the international balance remains ours, even as its requirements change in a new era.[39]

For the duration of the cold war, the strategic logic of theater nuclear weapons has resulted in large part from the perceived need of the United States to contain the Soviet Union on its own peripheries (which encompassed large portions of both Europe and Asia, including MacKinder's vital Eurasian heartland).[40] This strategy involved extending the protection of arms to allies who are positioned directly in the lee of a militarily preponderant and ideologically hostile continental land power. Consequently, one might quite understandably (and erroneously) infer that theater nuclear forces, and the concept of a proportionate, graduated deterrence that they served, have no meaning apart from that specific strategic relationship. However, while TNF might have once been weapons in search of a mission (which came home to roost in NATO arsenals as both heralds and staunch underpinnings of the flexible response strategy), these weapons appear to have found a permanent home in the logic of an extended deterrence grounded on the threat of graduated escalation. Consequently, the continued US commitment to a global system of independent centers of power could well indicate a new strategic requirement for such weapons. There are a number of reasons for considering the possibility that the same ties that have linked US security interests to those of its European allies through the escalatory medium of theater nuclear weapons might also govern future relationships with the nations of Europe and Asia.

The Residual Soviet Threat

FIRST, WHILE the United States and the Soviet Union are no longer militarily positioned "eyeball-to-eyeball" in Western Europe, the future of the Soviet Union as a continental and, possibly yet again, a global power has yet to be determined. The formidable nuclear and conventional capabilities still possessed by the Soviets, and the possibility of untoward political developments within the Soviet Union or vis-à-vis the West, make the complete dismantlement of existing security arrangements premature and risky. It would thus stand to reason that a policy of graduated deterrence, along with its supporting military implements (such as TNF), would be important to a stable strategic relationship during the present period of transition.[41]

Expanding Global Techno-Military Capabilities

Absent a resurgence in ideological or political competition with the Soviet Union leading to a new arms race, the United States will still be faced with the prospect of accommodating its commitment to "the stability of the international balance" with the interests of other nuclear powers or coalitions. Some of these, such as India and China, now possess intermediate-range delivery vehicles and have or will shortly have nuclear weapons.[42] As Robert L. Pfaltzgraff recently noted:

> We are in the midst of an accelerating diffusion of technologies that will increase the number of states in possession of the means for conducting military operations at the higher end of the conflict spectrum. This includes the proliferation of missiles, advanced aircraft, maritime platforms, and nuclear, biological, chemical, and conventional warheads.[43]

It is uncertain at the present time if the proliferation of advanced conventional, chemical, or nuclear weapons and associated delivery means can be arrested. Still, nearly a dozen nations already have such capabilities or are so far along the road to operational deployment as to be beyond the reach of effective non-

proliferation controls. Given such developments, one can justifiably question the feasibility of attempting to preserve a stable new world order—particularly in a nuclearized world gone entropic—by using the threat of unilateral or collective conventional military force alone.

Power Perceptions and Nuclear Weapons

The nature of current generation nuclear weapons, including the cumulative impact of technological advances in tailored weapons effects, could alter existing cost-benefit calculations. For example, the possibility of reduced collateral damage afforded by advanced tactical nuclear weapons might well lower, rather than raise, the so-called nuclear threshold relative to high-intensity conventional warfare. Such advances create something of a dilemma for the United States and its allies. For decades, the US has sought to convince the Soviets that, however awful the effects of TNW might be for both sides, NATO was perfectly willing to employ them should the need arise. In so doing, the United States might have sown some perceptual seeds regarding the political clout of such weapons and their potential war-fighting utility that could prove unfortunate in subsequent years. There are current indications that less affluent nations might indeed see nuclear weapons as a cost-effective means for attaining a significant measure of political influence vis-à-vis their regional neighbors or with the most advanced industrialized nations—in essence, political power on the cheap.[44]

Given the dazzling display of high-technology military might in Desert Storm, it is conceivable that the universal search for the great equalizer could turn toward the capabilities afforded (at seemingly low cost, compared to massive conventional forces) by enhanced radiation weapons and their kindred. In spite of their obvious disadvantages, nuclear weapons create operational possibilities that, although lurid, do indeed exist. One has only to note NATO's long standing reliance on the deterrent effects of tactical nuclear weapons to convince the Soviets of the futility of ever employing their vastly preponderant conventional forces. Consequently, it is quite possible, if not altogether certain, that these weapons could have irresistible appeal as a mean for bridging the void between first-rate conventional military power and the incipient combat capabilities currently possessed by a number of developed and developing nations. Regardless of what we would like to believe concerning nuclear weapons and the human condition, we must realize that nuclear weapons might not have the same connotations everywhere and to everyone who will ultimately possess them. That perceptions of utility might vary with strategic culture is evident from analyses indicating that "there is virtually nothing in the voluminous open Soviet tactical doctrine to support the notion that they make the sharp and important distinction we do between use and non-use of tactical nuclear weapons."[45] Granted that the Soviets seem, in recent years, to have "outgrown" their fixation on the operational merits of theater nuclear weapons, they have left a number of other actors in the nuclear arena whose propensities are less clear.

Global Side Effects of Future Regional Conflicts

The potential spillover costs of regional conflict (ecological as well as political, economic, and military) promise to be considerably higher than in the past in terms of threatening to disrupt the larger

status quo in which the United States has stated a vested interest. Although much of the international system as a whole will likely feel the crunch of increasingly scarce natural resources, possibly the most hazardous fallout could come from competition between such peripheral global powers as India, Pakistan, China, North Korea, the Republic of South Africa, as well as certain nations in the Middle East. Such nations share traditional (and deep-seated) antagonisms as well as advanced military capabilities. It is of course uncertain whether the prospect of an imminent Eurasian land war between comparably equipped regional nuclear powers would elicit an active military response from the United States in the interest of a stable international balance of power. Nor is it a given that the United States would intervene to avert the ecological consequences of any type of nuclear conflict, acting on behalf of what Jonathan Schell calls the fragile "ecosphere."[48] However, in light of the leveling effect of military capabilities discussed above, it is germane to consider how the United States might seek solutions to regional conflicts involving the potential use of nuclear weapons and possibly avert widespread radiologic contamination or other environmental side effects.

Deterrent Credibility

Given chronic regional instabilities and the continuing proliferation of weapons technologies, the most pressing of such open-ended issues involves the kinds of deterrent strategies likely to further future US security interests. Of obvious concern is the extent to which fiscal and political constraints will permit the United States to underwrite vital overseas commitments with large forward-deployed or rapid-reaction conventional forces.

The claims of strategic air power advocates aside, the massive costs and long logistics tail of the Desert Shield/Desert Storm campaign would seem to make future unilateral or even multilateral conventional military solutions to regional crises logistically difficult and painfully expensive for the United States. Even a modified containment strategy—predicated on regional security coalitions backstopped by the threat of massive US strategic conventional bombardment and shielded by antitactical ballistic missile defenses—is not a straightforward proposition from a cost-effectiveness standpoint.

From the US cultural perspective of high-intensity, low-cost military solutions, there is sufficient reason to recommend the concept of a conventional deterrent, predicated perhaps on the threat of a US global reach operation. From an Air Force perspective, such an operation might involve an intensive strategic air bombardment of the enemy's vital war-making centers of gravity, especially nuclear weapons and their delivery forces. However, denial of an adversary's nuclear option through conventional air power projection presents a couple of problems. First, despite the impressive successes scored by aerospace power in the conflict with Iraq in the Persian Gulf, one must question the deterrent credibility of conventional air bombardment for those nations possessing advanced military capabilities and a far more sophisticated understanding of their strategic and operational uses than the Iraqis (e.g., the Soviets, Chinese, and Indians, for starters). It remains to be seen whether the threat of such direct military action would deter an adversary possessing the means for escalating a regional conflict to the nuclear level (as well as an air defense system capable of challenging US strategic air operations).

In such a case, without the dire promise of a response-in-kind capability to dissuade a determined nuclear power or coalition from pursuing limited hegemonic objectives, how convincing would the threat of an air campaign really be?

Second, an adversary's threat to employ nuclear weapons against its regional neighbors in the event of a US attack on its homeland would seem to require an exceptionally high degree of confidence on the part of US decision makers that strategic conventional attack would, in fact, prevent rather than incite regional nuclear retaliation. Further, in much the same way as the doctrine of massive retaliation went the way of the dinosaurs almost as soon as it was enunciated, US strategic nuclear forces would seem to lack credibility as a deterrent lever against nuclear powers posing no direct threat to the United States itself.[47]

Theater Nuclear Forces

Operative Constraints

Assuming a progressive, or at least sustained, rapprochement between the United States and the Soviet Union, TNW could acquire a significantly different context than their present posture as absolute guarantees rather than as an escalatory control mechanism or firebreak between conventional and global nuclear war. However, such nuclear weapons as might be required to validate US deterrent guarantees vis-à-vis nuclear third parties must present lower escalatory risks than at present and be capable of providing decision makers with the most effective and responsive means possible for dealing with the demands of future crisis or conflict.

First, TNF should be considerably less capable of catastrophic global mischief than the theater nuclear forces that presently link conventional defense and a possible US strategic response to Soviet aggression. Decoupling theater and strategic nuclear policies may not be possible without dismantling the entire concept of graduated deterrence. Nor would it be particularly desirable to do so, even if it were feasible to treat strategic and theater nuclear forces as separable threats where the Soviet Union or some other global nuclear power were concerned. The need to minimize the risk of direct escalation in conflicts of interest between nuclear superpowers mandates that global and TNF remain part and parcel of the same seamless deterrent for the immediate future. This need of course presupposes a positive deterrent relationship, one predicated on the gradual drawdown of theater-based nuclear systems and modeled on continued constructive relations and effective arms control and verification measures. However, deterrence might be more discriminate, or focused on levels lower than the strategic composite of *capabilities, to deal effectively* with regional nuclear conflict. For example, a strategy of graduated deterrence of regional nuclear conflict or coercion would depend primarily on a credible, cost-effective conventional power projection capability backstopped by a carefully focused (and significantly smaller) nuclear threat centered on the nuclear war-making potential of possible adversaries. In cases where the interests of global nuclear powers did not conflict (or, in fact, coincided), reliance on the threat of theater nuclear weapons might well serve the common international interest while reducing the risk of collateral escalation to nuclear warfare on a Wagnerian scale.

Second, should deterrence in some future incarnation fail, the ability of the United States to respond appropriately could well depend on having a suitable range of response options and a flexible means of implementing them that encom-

passes both purely conventional and, in a retaliatory sense, limited nuclear operations. For example, the immediate threat of even a limited employment of nuclear weapons against US allies or overseas forces may compel the United States to ponder the comparative advantages of using low-order nuclear weapons and their conventional alternatives. Remote as it presently seems, the possibility is not inconceivable that US decision makers may consider military threats (particularly those of the nuclear-biological-chemical variety) sufficiently grave to require the most effective military response available. There is no guarantee that the immediacy and magnitude of such threats may not require a recourse to such weapons effects—be they nuclear or conventional—as offers of the highest probability of success in removing the threat decisively and instantaneously.[48] Without such capability, altering the war-making calculations of states (or even terrorist organizations) or contemplating the use of weapons of mass destruction could prove exceedingly difficult, short of deploying US ground and tactical air forces to particular zone(s) of conflict. Such a deployment could, in turn, require that the United States posture its strategic nuclear forces to ensure the safety of its own conventional forces from a limited nuclear attack.

Future Force Structure and Extended Deterrence

In terms of their strategic role in security calculations, theater nuclear weapons seem to have developed a flypaper quality that makes their disposal problematic for the foreseeable future. Developments in the international arms arena, the nature of existing nuclear weapons technologies, the US commitment to maintaining the status quo, and American perceptions of what constitutes an adequate/acceptable deterrent favor retaining such weapons and the flexibility they afford. If one accepts the argument that we are stuck with TNF for the foreseeable future, the question becomes one of force sufficiency: What kinds of weapons and delivery systems, and how many, might reasonably ensure that future conflicts involving nuclear weapons either do not occur or, at the very least, remain within manageable bounds acceptable to the United States.

There are a number of force structure options available that might provide theater nuclear capability adequate to deter regional nuclear conflict. Although they appear well within the present capability of the United States to achieve, certain options might carry significant political liabilities and could be considered less desirable as a consequence. Force structure alternatives include strategic delivery systems, dedicated (single-role) theater nuclear systems, dual-capable theater delivery systems, or combinations thereof. Implicit in each alternative are the necessary intelligence, communications, command and control, and other support systems. Implied as well are the design and production technologies essential to the kind of low-yield, discriminate-effects weapons necessary to maximize damage to chosen target types while minimizing collateral damage to nonmilitary infrastructures and populations.[49]

Perhaps the most obvious force structure alternative lies in the capabilities afforded by existing strategic delivery systems, including bombers, intercontinental ballistic missiles, sea-launched ballistic missiles, and cruise missiles. Continental United States or sea-based strategic delivery systems, carrying modified physics packages, might well be capable of achieving discriminate, low-order effects against a variety of hardened and unhardened targets within the

enemy's conventional military and nuclear weapons infrastructures. Further, such systems would obviate the problems of politically acceptable foreign basing and security arrangements that attend theater-based nuclear forces. While such a force might become the most cost effective of deterrent options in terms of modernization and sustainment costs, it also appears to be the one most fraught with undesirable political and strategic military side effects. If such forces were called to a higher state of alert (e.g., during a crisis involving possible nuclear use by a regional nuclear power), separating the actual from the perceived intent of the United States could be difficult for third-party nations. Given that the Soviet Union has not seen fit to discard its strategic agenda with regards to nuclear weapons, it would likely view with a jaundiced eye any US actions involving even the faintest possibility of nuclear employment. For, as Paul Bracken has noted, the extremely tight coupling of United States and Soviet nuclear warning, attack assessment, and command and control systems has made the risk of a Sarajevo effect more than a remote possibility in future crises; once the alert spiral has begun, the risk of a self-precipitating nuclear conflict could increase dramatically.[50] Another potential disadvantage of the strategic delivery force option is that it could convey at least the impression, if not the conviction, that the United States was reacting in a manner inconsistent with either the actual threat or to a declared American interest in the nonnuclear resolution of a regional crisis or conflict. While this reaction could obviously redound to the disadvantage of the United States in a general political sense, it could also make the threat of US nuclear retaliation less credible to the intended party. Of lesser concern, in terms of an adverse US public reaction and unfavorable responses on the part of allies and third-party states, is the political visibility of a deterrent threat made by using strategic nuclear delivery forces.

Dedicated, single-role theater nuclear forces have distinct advantages over strategic delivery forces in context of extended deterrence. Their purposes are defined in terms of the range and scope of their operational capabilities and the hazards they pose to potential target areas. Relative geographical constraints, limited size of payload, and other factors more clearly mark such systems as limited instruments of retaliation, although what is limited or unlimited is admittedly a function of where one is standing should such weapons ever be used. As a consequence, their relative credibility as measured means of enforcing an extended deterrence would be considerably greater than that of strategic nuclear forces and would be more closely linked to the conventional threshold of options available to US decision makers. Disadvantages of single-role forces include opportunity costs of development, deployment, and sustainment relative to those of multipurpose forces, the political and operational signatures of such forces, and the comparative lack of strategic/operational flexibility that they afford military planners in an era of limited defense resources.

Dual-capable theater forces possess an added advantage over dedicated theater nuclear forces in combining both conventional and theater nuclear warfare capabilities in a single command and control, basing, weapons delivery, and logistics support system. The economy of scale represented by such forces is hard to dispute, at least in terms of a utility-cost comparison. Perhaps more importantly, dual-capable forces up the ante automatically, in terms of providing an escalatory threat, by virtue of their innate ability to deliver nuclear weapons as well as conventional ordnance. Because the

signature associated with the alert and preparation of dual-capable forces for nuclear operations could be less distinct than for other types of nuclear forces, escalatory uncertainties posed by an opponent prior to or during a conflict could significantly affect his risk calculations. On the down side, whether dual-capable forces removed from the conventional conflict for the purpose of increasing the level of readiness for nuclear operations would adversely affect conventional operations depends on the types and numbers of delivery systems retained on nuclear alert at any one time. Further, it could be argued that a certain visibility in presence (and potential intent) is a vital ingredient in a deterrent force's probability of success. For dual-capable theater forces, such visibility might be somewhat reduced, either as a result of a relatively indistinct change in operational signature (e.g., alert versus conventional sortie rates) or enemy desensitization to the nature of such forces.

Regardless of the specific composition of the forces which ultimately comprise the US nuclear deterrent, the fundamental strategic requirements of flexibility and credibility in force capability should underpin the options that US decision makers bring to future bargaining tables. Consequently, as regards the future US extended deterrent, the fact of such a measured escalatory capability would seem to be as important as its form.

Conclusion

WHERE NUCLEAR weapons and the prevention of their use are concerned, the logic of graduated deterrence appears almost to have become self-perpetuating. While the arch foe (heretofore the Soviet Union) and specific cause (profound differences in political and social ideology) might change, strategic definitions of what constitutes a threat to US security interests will not differ too much in the future. The primary difference between what has come to pass and what is yet to be might well be the level of direct risk to the United States—strategic nuclear devastation in the case of deterrent failure vis-à-vis the Soviet Union as opposed to an inability to fulfill our security commitment to protect and assist allies threatened with some form of nuclear coercion. During the cold war, the TNF's primary role was nearly synonymous with precluding the Soviet use of conventional or nuclear force against the United States and its allies in Western Europe. Although a primary potential enemy has yet to emerge in the post–cold war era, the realities of life in a nuclearized world make it probable that threats to US global security interests significant enough to worry about will also be nuclear powers of some stripe. If the traditional threat continues to recede, deterrence through the escalatory threat of theater nuclear weapons could well become a matter of convincing potential adversaries of the lack of wisdom inherent in attempting to upset the global apple cart, particularly by employing or threatening to employ nuclear weapons. Whether one agrees with the specifics of such scenarios, certain types of nuclear forces, including those that can provide measured and discriminate response options if circumstance requires, will be necessary to ensure the stability of the international order in general and the security of US interests and its allies in particular. Regardless of future developments in the strategic relationship between the United States and the Soviet Union, the middle ground of deterrent options remains to be held. For the foreseeable future, such options would best be found in the capabilities of technologically advanced theater nuclear forces.

Notes

1. Scott D. Sagan, *Moving Targets: Nuclear Strategy and National Security* (Princeton, N.J.: Princeton University Press, 1989), 4. While the paradox created by nuclear weapons appears to be a simple restatement of Bernard Brodie's original thesis that the existence of such weapons has obviated the need for their use, it implies much more in terms of structuring the deterrent. Threat credibility requires a certain measure of capability, which in turn necessitates choices as to nuclear force design, size, and targeting philosophy. As Sagan points out, deterrent policy requires that nuclear weapons "be useable but not too useable." See also Bernard Brodie, *War and Politics* (New York: Macmillian, 1973), 376–77.

2. Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 1 December 1989. This joint publication uses *tactical* rather than *theater* or *nonstrategic* to define the uses of nuclear weapons in support of missions of "limited scope" or specific military operations. Yet NATO and such documents as the *Report to the President and the Congress* use the strategic/nonstrategic dichotomy in discussing nuclear forces. Given the confusion between the tactical and strategic levels of war which might ensue if this convention were followed here, the term *theater nuclear weapon* or *theater nuclear forces* will be used, and *strategic* or *global* will be used to depict SIOP forces dedicated to the deterrence of general nuclear war. It is important to remember that all weapons can have strategic implications.

3. That the original US strategic doctrine of massive retaliation lacked credibility as a means of guaranteeing European security enhanced the appeal of graduated responses to (Soviet) aggression. Ironically, the NATO strategy of flexible response generated even more pointed criticism for its perceived incredibility and risk provocation during the nuclear *quo vadis* debates of the 1970s and early 1980s. The contentions of Robert S. McNamara, et al. (the so called gang of four) highlighted the uneasiness felt in the defense policy community over what was seen by many as a dangerously unrealistic dependence on the properties of nuclear weapons to achieve finite political ends. The detailed rationale for such criticisms of the alliance's nuclear-based strategy can be found in William P. Bundy, ed., *The Nuclear Controversy* (New York: The New American Library, 1985), 79–94; and David N. Schwartz, *NATO's Nuclear Dilemmas* (Washington, D.C.: The Brookings Institution, 1983), 173–77.

4. Considerable agreement exists among analysts on the most significant factors in strategy formulation. According to Robert S. Wood, future US security policies will depend on the relationships between geopolitical positions and changing technology, US institutional values and changing global threats and opportunities, and the state of the US economy and public support for foreign/defense investments. See Robert S. Wood, "Strategic Choices, Geopolitics, and Resource Constraints" in *Washington Quarterly* 12 no. 3 (Summer 1989): 139. Bernard Brodie saw several dimensions to the problem of defining an effective strategy based on nuclear weapons: (1) the changing physical requirements for preserving our retaliatory capabilities; (2) the question of how much capability, nuclear or conventional, is required to support a strategy built on deterrence; and (3) the utility of other than strategic nuclear weapons (i.e., tactical nuclear forces) in extending deterrence to regions threatened by Soviet conventional capabilities. See Bernard Brodie, "The Development of Nuclear Strategy," *International Security* 4 (Spring 1978): 65–83.

5. See Lt Gen Frederick J. Brown, "The Uncertain Path," *Military Review*, June 1990. The author argues for a carefully crafted military capability in the face of what appears to be a return to a maritime, as opposed to a continental or Euro-centered, strategy. General Brown is far more cautious than this quote indicates in his appraisal of future security challenges and the means by which significantly smaller US forces might best meet them.

6. According to some theorists the view that war is the ultimate manifestation of human wickedness is uniquely Western (a product of the Judeo-Christian ethic) and not necessarily shared in other cultural traditions. As a cultural phenomenon, war is seen in many societies as an acceptable or even desirable means of resolving long-standing or irreconcilable differences. See Adda B. Bozeman, "War and the Clash of Ideas," *Orbis* 20, no. 1 (Spring 1976), 65–67. For a related perspective, see Michael Howard, *The Causes of War*, 2d ed. (Cambridge, Mass.: Harvard University Press, 1983).

7. Howard, 54. The key point is that effective strategy presupposes an accurate understanding of the direction, if not the precise nature, of environmental change.

8. Value and fact are inseparable parts of the decision-making process, especially when the process involves policy designed to achieve some purpose of importance to an organization or institution. Purposive judgment of necessity combines value and factual elements. See Herbert A. Simon, *Administrative Behavior*, 3d ed. (New York: Free Press, 1976).

9. Colin S. Gray, *Nuclear Strategy and National Style* (Lanham, Md.: Hamilton Press, 1986), 36. In a later work, Gray emphasizes that differences in the geographic situations and historical experiences of various nations have produced unique views of, and means of dealing with, future threats to particular national security interests. Hence, Gray maintains a continental (Soviet land power) and maritime (US sea power) dichotomy in strategic vision. See Colin S. Gray, *War, Peace, and Victory: Statecraft for the Next Century* (New York: Simon & Schuster, 1990). Carried one step further, such cultural divergencies might apply to attitudes toward the general nature of warfare and ways of employing the weapons of war.

10. Col Dennis M. Drew and Dr Donald M. Snow underscore de Tocqueville's observation that American-style democracy "finds it difficult to coordinate the details of a great undertaking and to fix on some plan and carry it through with determination in spite of obstacles." See Col Dennis M. Drew and Dr Donald M. Snow, *The Eagle's Talons* (Maxwell AFB, Ala.: Air University Press, December 1988). See also J. P. Mayer, *Alexis de Tocqueville: Democracy in America*, trans. George Lawrence (New York: Harper & Row Publishers, 1966), 211.

11. Drew and Snow, 395. The American military solution—the overwhelming application of firepower to effect a speedy resolution of the conflict—proved frustratingly inappropriate in Vietnam, given policy constraints on the application of military power during that conflict as well as the nature of the war that the North Vietnamese and Vietcong were fighting. For a survey of the genesis and development of American military thought on the operational conduct of war, and particularly the strategy of annihilation, see also Russell F. Weigley, *The American Way of War* (Bloomington, Ind.: Indiana University Press, 1973).

12. Hans G. Stoll, "Air Option Will Save U.S. Lives," *Miami Herald*, 17 December 1990, G-1. See also Giles Elgood, "Air Forces Could Win It Alone, British Military Says," *Washington Times*, 26 December 1990, 1.

13. Brodie, 332. For a focused discussion of the facts of US strategic policy between 1960 and 1985 and some perceptual biases upon which it was based, see Gray, *Nuclear Strategy and National Style*, 40.

14. Desmond Ball, "U.S. Strategic Forces: How Would They Be Used?" in *The Art and Practice of Military Strategy*, ed. George Edward Thibault (Washington, D.C.: National Defense University Press, 1984), 620. Ball maintains that US strategic nuclear policy assumes different forms at different levels of implementation: where declaratory policy describes US nuclear strategy in a general and relatively abstract fashion, arms control, force development, and force employment policies evolve in related but unique and distinctive ways. A similar view holds that nuclear strategy is a product of bureaucratic processes, shaped as much by the mundane activities of force development, budgeting, and target planning as it is by discrete policymaking. See David Alan Rosenberg, "U.S. Nuclear Strategy: Theory Versus Practice," in *Military Strategy: Theory and Application*, ed. Arthur F. Lykke, Jr. (Carlisle Barracks, Pa.: US Army War College, 1989), 328.

15. Jeffrey Record, *Revising U.S. Military Strategy* (Washington, D.C.: Pergamon-Brassey's, 1984), 3.

16. Secretary of the Air Force Donald B. Rice, *The Air Force and U.S. National Security: Global Reach—Global Power*, white paper (Washington, D.C., Department of the Air Force, June 1990), 6-8.

17. In similar fashion, Gen George B. Crist, former US Central Command commander, sees a power projection strategy as the most promising means of ensuring US security interests in the future global environment. Such a strategy would include smaller US nuclear forces, modernized and restructured to maintain a credible deterrent, as well as a streamlined central reserve composed of active and reserve components based in the United States. See Gen George B. Crist, "A U.S. Military Strategy for a Changing World," *Strategic Review* (Winter 1990): 17. Of note concerning cost implications of a massive military establishment is Paul Kennedy's contention that reliance on the military option as a primary element in the exercise of national power has historically marked the start of a general decline in such power. See Paul Kennedy, *The Rise and Fall of the Great Powers* (New York: Vintage Books, 1987), 539.

18. Contrary to a common belief that new and more potent conventional weapons capabilities represent but another step on the scale of weapons effects below the nuclear firebreak, Thomas J. Welch maintains that advanced conventional weapons have obviated the classic distinction between nuclear and nonnuclear effects. For a compelling assessment of advances in weapons technology as they apply to present concepts of deterrence and warfighting, see Thomas J. Welch, "Technology Change and Security," *Washington Quarterly* 13 (Spring 1990): 111-20. Likewise, Bernard Brodie came to conclude that, given the dilemma imposed by NATO's significant conventional inferiority in Central Europe, low-yield or enhanced radiation nuclear weapons made for a more efficient deterrent than did a suitably equipped all conventional force. See Brodie, "The Development of Nuclear Strategy," 77.

19. The fusion of tritium and deuterium nuclei produce as many as six times more high-energy, or fast, neutrons per units of yield than fission reactions. For more details concerning comparative magnitudes of blast and radiation in enhanced radiation weapons, see Thomas B. Cochran, William M. Arkin, and Milton M. Hoenig, *Nuclear Weapons Data Book* (Cambridge, Mass.: Ballinger Publishing Co., 1984), 28.

20. S. T. Cohen, *The Neutron Bomb: Political, Technological, and Military Issues* (Cambridge, Mass.: Institute for Foreign Policy Analysis, Inc., 1978), 66–67. A crucial point worth remembering about enhanced radiation weapons is that the benefit of their radiation effects inheres in the small nuclear yield necessary to achieve these effects, not in the total elimination of the blast or other effects. See also Cochran, Arkin, and Hoenig, 28.

21. John P. Rose, "Nuclear Weapons: Image Versus Reality," in Lykke, 337. Technology has made it possible to construct nuclear devices that no longer indiscriminately produce, to the same degree, the effects traditionally associated with nuclear weapons.

22. The moral dimensions of even the threatened use of nuclear weapons are particularly troubling for many. While endorsing the concept of war avoidance through armed deterrence in a general sense, the US Catholic bishops appeared to stop short of validating deterrence based on the threat of nuclear weapons. In condemning total war

as failing the criteria of proportionality and discrimination for just war, the bishops noted the declaration of the Second Vatican Council that: "Any act of war aimed indiscriminately at the destruction of entire cities or of extensive areas along with their population is a crime against God and man himself." The problem posed by nuclear weapons in such a regard is that, by the very nature of their effects, they cannot be guaranteed *not* to cause the kind of destruction condemned by both Council and bishops. See their pastoral letter, "The Just War and Non-Violent Positions," in *War, Morality, and the Military Profession*, ed. Malham M. Wakin (Boulder, Colo.: Westview Press, 1986), 250.

23. Through at least the early 1970s, "the historically unique features of nuclear weapons, the quality of energy released, and the very brief time span for destruction were folded into (Soviet) military thought and preparations that envisaged decisive results from military action." See Gray, *Nuclear Strategy and National Style*, 68.

24. Prior to the doctrine of follow-on forces attack (FOFA), the deployment of battlefield nuclear weapons to Europe was seen to be the only effective offset to the large masses of Soviet armor that were expected to provide both the spearpoint and motive-force behind the envisaged Soviet conventional offensive. Absent the large amounts of territory needed to conduct either an elastic or a defense in depth—and NATO's commitment (at the behest of the West Germans) to a forward defense—the issue became one of raising the threshold of militarily effective violence (and, of course, escalatory risk) or succumbing rapidly to a conventional onslaught.

25. As a corollary, the reduction in the delivery effort (or immediate exposure to en route or terminal area defenses) should mean lower projected attrition rates and a broader range of apportionment choices. However, Deitchman maintains that advances in the capabilities of tactical air power in particular might have reached a culminating point with the advent of sophisticated (and highly lethal) air defense systems, partially negating such gains in conventional combat efficiency. See Seymour J. Deitchman, *Military Power and the Advance of Technology: General Purpose Military Forces for the 1980s and Beyond* (Boulder, Colo.: Westview Press, 1983), 46–47, 52.

26. John P. Rose, *The Evolution of U.S. Army Nuclear Doctrine, 1945–1980* (Boulder, Colo.: Westview Press, 1980), 47.

27. Otto Heilbrunn, *Conventional Warfare in the Nuclear Age* (New York: Frederick A. Praeger, 1965), 38–46. In a pointed indictment of US thinking on potential operational implications of theater nuclear weapons, Lt Col Jerry M. Sollinger (US Army) criticizes unwieldy nuclear weapons release procedures and a general doctrine that he believes is based on unrealistic expectations as to the pace and source of possible nuclear escalation during a conventional conflict. Sollinger also deplores the relative lack of military emphasis on survivability measures, such as dispersal, hardening, and redundancy. See Jerry M. Sollinger, *Improving U.S. Theater Nuclear Doctrine: A Critical Analysis* (Washington, D.C.: National Defense University Press, 1983).

28. According to US Army operational doctrine extant into the 1980s, control, concealment, counterfire, dispersal, mobility, protection, and prior warning of nuclear strikes were prerequisites to unit survival on the nuclear battlefield. See Victor Utgoff and W. M. Christenson, "Battlefield Nuclear Forces: An Undervalued Option for An Improved Deterrence in Europe," 99–107, and Stephen D. Biddle, "Can Conventional Forces Substitute for BNW?" in *Battlefield Nuclear Weapons: Issues and Options*, Center for Science and International Affairs, Occasional Paper 5 (Boston: University Press of America, 1989), 71–72.

29. Prepared statement by Dr Richard L. Wagner, Jr., assistant to the secretary of defense for atomic energy, Minutes of Senate Subcommittee Hearing on Strategic and Theater Nuclear Forces, Defense Authorization Appropriations for Fiscal Year 1985, 98th Cong., 2d sess., 1984, 3634.

30. Daniel Charles, *Nuclear Planning in NATO* (Cambridge, Mass.: Ballinger Publishing Co., 1987), 25.

31. Ibid., 38, 40, 45.

32. Edward Luttwak, "The Problems of Extending Deterrence," in *The Art and Practice of Military Strategy*, 706. According to Luttwak, the promise of escalation to levels of nuclear violence unacceptable to the opponent is the mechanism which makes extended nuclear deterrence work. The credibility of the escalatory threat hinges, in turn, on such factors as the apparent importance of the interests sought to be brought under the nuclear umbrella and the overall balance of strategic nuclear capabilities.

33. Thomas C. Schelling, "Arms and Influence," quoted in Paul K. Huth, *Extended Deterrence and the Prevention of War* (New Haven, Conn.: Yale University Press, 1988), 3–4.

34. Ibid., 2–4.

35. J. Michael Legge, *Theater Nuclear Weapons and the NATO Strategy of Flexible Response*, Rand Report R-2964-FF (Santa Monica, Calif.: Rand Corporation, 1983), 42.

36. In the view of at least one German ministry of defense official, "It is illusory to conceive of a stable conventional balance in Europe (even if this ideal could somehow be achieved) as a mechanism that could function divorced from the nuclear equation and from the geopolitical reality of the power relationships on and over the Eurasian land mass." Quoted in Eric H. Thoemmes, "Restructuring NATO's Nuclear Posture: Objectives, Options, Obstacles," *Strategic Review* (Summer 1989): 60.

37. Statement of the Second Vatican Council, in "The Just War and Non-Violent Positions," 245.

38. Recent US foreign policy and defense posture statements support the general conclusion that, for the foreseeable future, the United States will pursue a policy of global engagement in terms of helping to maintain, as it did in the Persian Gulf conflict with Iraq, a stable global state of affairs favorable to US interests. For broad conceptual outlines of US security strategies for the 1990s, see

Department of Defense, *The National Security Strategy of the United States* (Washington, D.C.: Government Printing Office, 1990) and Department of Defense, *The Report of the Secretary of Defense to the President and the Congress* (Washington, D.C.: Government Printing Office, 1991).

39. *The National Security Strategy of the United States*, 1-2.

40. Mahanian concepts of maritime supremacy as the essence of US national security strategy failed to address the global power potential of a Eurasian imperium or coalition of states. Such a realization in post-World War II US strategic thinking can be seen in John Foster Dulles' 1954 statement that

> there is no local defense which alone will contain the mighty landpower of the Communist world. Local defenses must be reinforced by the further deterrent of massive retaliatory power. Otherwise (a potential aggressor) might be tempted to attack in places where his superiority was decisive.

Quoted in Rose, *The Evolution of U.S. Army Nuclear Doctrine*, 85. Gray also emphasizes this perspective. See Gray, *War, Peace, and Victory*, 58-62.

41. Gen George L. Butler notes the critical importance of maintaining a "modern, credible, and survival nuclear deterrent force" until such time as Soviet nuclear capabilities no longer require it. See Gen George L. Butler, "Adjusting to Post-Cold War Strategic Realities," *Parameters* 21 (Spring 1991): 4.

42. The Indians, for example, point to Pakistan's possession of intermediate-range ballistic missiles and China's deployment of missiles to Tibet as imperatives for developing an effective ballistic missile capability. Although neither India nor Pakistan have declared themselves to be nuclear powers, that remains a very real option, should regional, political, or military conditions appear to require it. See "The Indian Missile Program," *Defense and Diplomacy* 10 (October 1990): 45, 47.

43. Robert L. Pfaltzgraff, Jr., "The United States as an Aerospace Power in the Emerging Security Environment" (Paper presented at a Fletcher School symposium on "The United States Air Force: Aerospace Challenges and Missions in the 1990s," 3 April 1991).

44. Noting the apparent success of NATO's theater nuclear deterrent in forestalling war in Europe for 45 years, one third world observer saw nuclear power as indispensable in providing political muscle to ensure national self-interests. For an especially chilling perspective on how nuclear weapons might be seen by aspiring regional powers, see Jai Narain, "Political Power in the Nuclear Age," *Journal of the United Service Institution of India* 31, no. 496 (April-June 1989): 163-77.

45. Brodie, 76.

46. Jonathan Schell, *The Fate of the Earth* (New York: Alfred A. Knopf, 1982), 77.

47. That the United States might be unwilling to risk a general nuclear exchange as the result of a Warsaw Pact conventional assault on Western Europe has haunted NATO security theoreticians for decades. In attempting to establish a meaningful relationship between interest-value and the willingness to employ nuclear weapons, Herman Kahn identified three types of deterrence involving the United States and the Soviet Union. Each type is based on a variable ratio of interest to threat: type I aims to prevent direct, all-out attack on one's own (or, presumably) allied territory; type II aims to discourage "extreme provocations" short of direct attack; and type III addresses minor or moderate threats to national interests. What constitutes appropriate forces and weapons is a direct function of the type of deterrence sought. See Herman Kahn, *Thinking About the Unthinkable in the 1980's* (New York: Simon & Schuster, 1984), 110-22.

48. The point is made that in conflict or crisis "warning time is far more likely to be exploited (in effective fashion) by key decision makers if they have a large menu of discriminate response options from which to choose." Although General Butler made this observation regarding the larger issue of conventional conflict, it would seem to apply equally well to nuclear crises. See Butler, 8.

49. This separation of weapon effects adds a dimension to warfare that has not existed before in any effective measure. It offers the opportunity, should the need arise, to attack enemy personnel near or within urban areas without inflicting high levels of physical damage to those areas. Quoted in Lykke, 338.

50. Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven, Conn.: Yale University Press, 1983), 215.

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