



On Not Confusing Ourselves

*Essays on National Security Strategy
in Honor of
Albert & Roberta Wohlstetter*



edited by

*Andrew W. Marshall, J. J. Martin,
& Henry S. Rowen*



Westview Press



On Not Confusing Ourselves

In many ways the 1990s will be like the 1950s as the United States searches for strategies to deal with a new set of security problems. Such is the setting for this festschrift written by distinguished colleagues of Albert and Roberta Wohlstetter. This is a tribute to the Wohlstetters and to their pioneering work at RAND in the 1950s as well as an examination of security issues of the 1990s.

The first part of the book is a retrospective, outlining developments introduced by the Wohlstetters and tracing their subsequent impact on U.S. national security policy and military forces. The contributors expand on the Wohlstetters' major themes with their own contributions to strategic thought, asking why the Soviets have such large forces, why U.S. technology has fallen on hard times in U.S. strategy, and how net assessment influences the defense department. In the second part, they examine issues crucial to the reshaping of U.S. strategy, ranging from nuclear weapons policy to security concerns in Asia and the Third World. The volume concludes with essays on the intellectual infrastructure needed to address security problems of the 1990s: the art of net assessment, the qualities of a good strategist, and the vital role of character in strategy.

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Edited by Andrew W. Marshall, J. J. Martin,

and Henry S. Rowen

with an Introduction by Robert W. Marshall

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Foreword

"It's a perfectly beautiful city; that makes up for the food."

Such was the verdict of Albert and Roberta Wohlstetter about Prague on this historical occasion, their first visit behind what used to be the Iron Curtain. Through lifetimes devoted to defending the United States, the West, and the democratic tradition from the Leninist menace, they had never succumbed to the temptation to take a firsthand look. Albert claims it had something to do with security clearances. Those of us who have traveled with him to nearly every other corner of the globe know the real deterrent was the threat of Marxist-Leninist food.

"Is the venison rare?" he asked of the overly exuberant waiter at the U Zlate Hrusky, where dinner for six cost 1,955.90 Czech crowns, or \$13.00 a person at the official rate of exchange, including drinks, wine, and a tip. I know, for with steely determination and considerable advance planning, I managed to cadge the Czech check, saying I wanted to repay lunch on Vienna's toniest terrace earlier in the week. Alas, the venison was overcooked, but the restaurant had been operating in Prague for three hundred years, two hundred of them at this location on Novy Svet, around the corner from the Hradcany Castle. If the food flunked, the ambience passed.

And naturally the conversation was electric. Packet switching, for example, was the way to keep a command, control, and communications network up when nuclear attack disrupted its nodes—also a good idea for telephone companies. The capacities of this microchip versus that—mercifully, I can never remember the numbers—and the implications for missile defense. And also what at some crucial intellectual juncture this technical wizard said to that one—I can never remember the names, either.

But then, I missed the first half of the Wohlstetters' careers. I truly would have loved to have been there when they weighed Herman Kahn by displacement in their swimming pool in the Hollywood hills. Or when Joanie, the Wohlstetters' daughter, brought home a Spanish classmate from Hollywood High named Richard Perle, having first

slipped him a copy of Albert's seminal article, "The Delicate Balance of Terror." This launched Richard's career in strategy.

Memories of those days echoed even under the medieval beams of Prague. Albert remembered, for example, the one critical review of Roberta's 1962 book, *Pearl Harbor: Warning and Decision*. It won the Bancroft Prize and widespread acclaim, but a famous British strategist criticized her for starting the story in the middle, with a radar trainee staying late to practice and, when his screen lit up, being told by a duty officer to forget it. A good laugh for the journalists present, whose creed is, if you have a good story, tell it now and then.

"What about your books, Mr. Wohlstetter?" an innocent diner asked. Well, Albert allowed, most of them are classified. Albert has not often been accused of being bashful, but you can't quite expect a man to say: Well, I headed this study of SAC bases when we first figured out that in a nuclear exchange there's a difference between the first strike and the second strike. And, of course, his record of strategic insights and predictions since then would astonish any listener.

Here we were, gathered in Prague to celebrate American Independence Day and the new freedom Czechoslovakia won in 1989, when the communist superpower started shedding satellites and losing its grip on internal republics. A miracle year, yes, but not a total surprise to those of us who four years earlier suffered through the *prix fixe* dinner at an impossibly pretentious Michelin restaurant in Nice as part of a conference convened by Albert and Roberta entitled "Fault Lines in the Soviet Empire."

The very idea disturbed the conference's distinguished Europeans, as it no doubt would disturb many Americans. NATO is defensive, they held, and there are offensive overtones to planning to exploit the Soviet nationalities problem, even after war breaks out. But when 1989 dawned, this conference material was handy in my files and no doubt in more important files as well.

I recall another memorable meal at a Wohlstetter conference—grilled *lüfer* at a simple outdoor restaurant on the banks of the Bosphorus, where one could look from Europe into Asia, watching the lights on the nets where the previous night this pike-like repast had been taken. Sharing the meal with a young Wohlstetter protégé named Paul Wolfowitz and Pentagon veteran Andy Marshall, I pondered why Albert and Roberta had summoned us to Istanbul at a time shortly after the shah had fallen in Iran and turmoil gripped the Islamic world. Was Turkey to be the next problem?

In this case the food was more than incidental, for the most important revelation of the trip was that the Turks make their own wine. A week spent visiting Istanbul, let alone talking seriously with Turkish

officials, made it hard to conceive that this secular, proud, never-conquered, and Western-looking nation could be carried away by ancient religious fervor. The Turkish conference resulted from Albert's massive studies of Persian Gulf contingencies, emphasizing the loss of Western bases and air rights. In a Gulf conflict, what the West needed was access. Turkey was not the next problem; Turkey was the answer. (At the copy deadline for this book, the West is mobilizing against the Iraqi invasion of Kuwait, with Turkey being the first to close down Iraqi oil exports and the first to provide bases for American planes.)

The temptation is great to continue with the lode of anecdotes I accumulated since first meeting Albert and Roberta over Szechwan food—just coming into fashion in Washington in 1969, which was also the year of the great ABM debate. There was the ORSA report, when Albert somehow managed to set the Operations Research Society of America on his opponents' methodology. There was the University of Chicago, where the Wohlstetters used to spend half the year in a perfectly located apartment overlooking Lincoln Park. There was Japanese food in the seaside resort of Oiso, trying to persuade Americans and Japanese that they were allies even without a Soviet threat.

If there is one theme that runs through the Wohlstetters' work over the years, from the SAC basing study to the celebration in Prague, it is the necessity of preparing to meet realistic threats, not the unlikely contingencies of an out-of-the-blue nuclear strike or a tank attack through the Fulda gap. To use the title of the 1988 report of the commission Albert cochaired with Fred Iklé, the theme is *Discriminate Deterrence*.

This report was typical of the work Albert and Roberta have contributed over the years: sheer intellectual effort in the role of consultants to the government. Similarly, they have been members of various Pentagon panels, some prestigious and some unpublicized. They were one of only two couples jointly awarded the Presidential Medal of Freedom, the nation's highest civilian award (the other was Dewitt and Lila Wallace of the *Reader's Digest*). Those in a position to understand recognize well their remarkable intellectual contribution to the Republic and its safety.

Not the least of their means of influence has been the gathering together of a remarkable circle of thinkers and dining companions. I remember Jim Digby's precision weapons and poached salmon, not to mention his cellar of French wines in the California hills. I remember seeking an ancient mountain restaurant somewhere over the Third Corniche with Fred Hoffman, better to discuss energy policy. Many of this circle—Harry Rowen, Fred Iklé, Richard Perle, Paul Wolfowitz—went on to hold high positions in the U.S. Defense Department.

Albert, though, has never accepted a policy post. For one thing, there's the Pentagon mess. For another, there's his brother Charles, one of the founders and longtime chairman of Continental Telephone Corporation. "I told him if he ever did that I'd come break his leg," I recall Charles telling me one night. "He can't go work in Washington; he can't tell a lie."

I recall a more recent night when Charles told me he was sending Albert a fax almost every day ordering him to work on his long-promised memoirs. For the Prague conference, Albert wrote of the penetrating power of modern communications: "The fax will make you free." But Charles's faxes face a harder task: With Albert and Roberta feasting their way into the second half of their seventies, it's still impossible to tear them away from daily events long enough for them to reflect on their remarkable career together. Despite the urging of Charles and many of the rest of us, my bet is that before we read those memoirs, U Zlate Hrusky will be serving its venison rare.

Robert L. Bartley
Prague

Preface

The idea of a festschrift first occurred to some of us as we sat in the audience at the White House watching President Reagan award Medals of Freedom to Albert and Roberta Wohlstetter in November 1985. What could we do to recognize them, perhaps on the occasion of their seventy-fifth birthdays, which would be approximately two years hence? The German concept of paying tribute to scholars by publishing a collection of essays in their honor seemed particularly appropriate.

It took us considerably longer than two years to assemble the festschrift, not least because many of the authors were heavily involved during 1986-1988 working with Albert in support of the Commission on Integrated Long-Term Strategy. Because of such commitments not all of the many friends, colleagues, and former students of Albert and Roberta Wohlstetter were able to contribute to this book. They all, however, join us in showing our regard for the Wohlstetters and their work.

Although the primary purpose of the book is to present essays about areas of national security in which the Wohlstetters have worked, it also has a larger theme. The security environment of the 1990s already is proving to be quite different from that of the past several decades of U.S.-Soviet competition. This will be a decade of multipolar security problems unlike those Americans have been accustomed to dealing with: who our adversaries are and what challenges they present will be both less clear and less permanent; economics will be a greater consideration in the security environment; weapons technology will continue to advance at a rapid rate, and increasingly it will be available to small and medium powers as well as to the major, traditional powers. In many ways the environment of the 1990s will be like that of the 1950s, as America searches for strategies to deal with a new set of security problems.

This festschrift, completed at the start of the 1990s, is both a retrospective on the earlier years and a look forward. Part One, the retrospective, reflects on the contributions of the Wohlstetters and of RAND, where they both worked in the 1950s. It examines the evolution

of U.S. strategic doctrine, considers why Americans are ambivalent about strategic defenses, and looks at the changing fortunes of technology in U.S. strategy. The book then goes on to discuss the need to link response with warning, inquire into why the Soviet Union feels it must have such large military forces, and ask for more candor in NATO's public statements. The retrospective ends with a history of the analytic discipline of net assessment in the Department of Defense.

Part Two looks forward into the 1990s. It discusses ways to plan for military competition in the coming years, asks about the future of nuclear strategy, examines trends in Asia, traces the change of the Third World from playing field to player, and reviews the accelerating proliferation of advanced weapons among small and medium powers. The book concludes with essays on several aspects of the intellectual infrastructure needed to deal with the security problems of the 1990s: the art of net assessment, what it takes to be a good strategist, and the vital role of character in strategy. Who knows, it may not be coincidental that this final chapter on character sketches a silhouette with recognizable features.

Many contributors included brief reminiscences about the Wohlstetters, giving the book a personal touch that is entirely suited to a festschrift. The appendices contain biographical sketches of Albert and Roberta, and the unclassified and declassified writings of the Wohlstetters are listed in the bibliographies.

Science Applications International Corporation supported in part the editing of this book. Susan Londos, Penny Struthers, Christopher Twomey, and Marilyn Readel assisted with the preparation of the final manuscript. Special thanks are due to Susan and Penny for helping to make the manuscript "just right" and to Chris for tracking down obscure references for the chapter notes.

Andrew W. Marshall

J. J. Martin

Henry S. Rowen

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Margo Hartman is an administrative assistant to Albert and Roberta Wohlstetter.

Fred S. Hoffman is a consultant on economic and national security policy in Los Angeles. He was director of Pan Heuristics during 1981–1989 and held various positions on the research staff of RAND during 1950–1964 and 1973–1981. Mr. Hoffman worked on nuclear force posture issues in the Office of the Secretary of Defense in 1965–1967 and was assistant director of the U.S. Bureau of the Budget in 1967–1969. He has served on a number of government advisory panels and currently is a member of the Defense Policy Board and Chief of Naval Operations Executive Panel.

Fred Charles Iklé is Distinguished Scholar at the Center for Strategic and International Studies in Washington. He was under secretary of defense for policy in the Reagan administration and director of the U.S. Arms Control and Disarmament Agency under Presidents Nixon and Ford. He was at RAND in 1954–1961 and again in 1968–1972, when he was head of the Social Science Department. During 1963–1967 Dr. Iklé was professor of political science at the Massachusetts Institute of Technology. In 1987 he cochaired the Commission on Integrated Long-Term Strategy with Albert Wohlstetter. He is the author of several books, including *How Nations Negotiate* and *Every War Must End*.

Andrew W. Marshall founded the Office of Net Assessment in the Office of the Secretary of Defense in 1973 and has been its director since that time. Mr. Marshall served on the staff of the National Security Council in 1972-1973 and was at RAND during 1949-1972, where he was director of strategic studies (1969-1972).

J. J. Martin is a sector vice president at Science Applications International Corporation in La Jolla, California. He worked on nuclear strategy in the Office of the Secretary of Defense during 1968-1976. Dr. Martin was senior counselor to the Commission on Integrated Long-Term Strategy and during 1980-1988 was executive secretary for the New Alternatives Workshop, which was chaired by Albert Wohlstetter.

William E. Odom is director of national security studies for the Hudson Institute in Washington. He is a specialist on the Soviet Union, has written many articles on the USSR, and has published a book, *The Soviet Volunteers*. Dr. Odom retired from the U.S. Army after thirty-four years of service. During this time he was director of the National Security Agency, assistant chief of staff of the army for intelligence, and a senior member of the staff of the National Security Council.

Richard N. Perle is a resident fellow at the American Enterprise Institute for Public Policy Research in Washington. He was assistant secretary of defense for international security policy in the Reagan administration. During 1969-1980 he served on the staff of Senator Henry M. Jackson and on the staff of the Senate Committee on Armed Services.

George E. Pickett is director of the Northrop Analysis Center in Washington. He holds an M.B.A. from Harvard Business School and was one of the first members of the net assessment group on the National Security Council staff and in the Office of the Secretary of Defense.

Stephen Prowse is an economist with the Board of Governors of the Federal Reserve System in Washington. He also is a defense consultant and a fellow with the American Institute for Strategic Cooperation. Dr. Prowse was a member of the Pan Heuristics research staff in 1983-1989.

James G. Roche is the vice president and special assistant to the president and chief executive officer of the Northrop Corporation in Los Angeles. He holds his doctorate from Harvard University, is a retired navy captain, having commanded a guided-missile destroyer, and has served in the Office of the Secretary of Defense (Office of Net Assessment). Dr. Roche was a senior staff member for the Senate Select Committee on Intelligence, the principal deputy director of the State Department's Policy Planning Staff, the Democratic staff director

of the Senate Committee on Armed Services, and the vice president and director of the Northrop Analysis Center in Washington.

Stephen Peter Rosen is an associate professor of government and associate director of the John M. Olin Center for Strategic Studies at Harvard University. He has served as a civilian assistant to the Director of Net Assessment in the Office of the Secretary of Defense, as director of political-military affairs on the staff of the National Security Council, and as a secretary of the navy fellow and a professor in the strategy department at the U.S. Naval War College. Dr. Rosen is the author of the forthcoming book, *Theories of Victory: Innovation and the American Military*.

Henry S. Rowen is assistant secretary of defense for international security affairs. He is the Edward B. Rust Professor of Public Policy and Management at the Graduate School of Business, Stanford University, and a senior fellow of the Hoover Institution. Dr. Rowen has served as chairman of the National Intelligence Council, held positions in the Office of the Secretary of Defense and the U.S. Bureau of the Budget, and during 1967–1971 was president of the RAND Corporation.

Leon Sloss is president of Leon Sloss Associates, a consulting firm in Washington that conducts national security policy studies for government and industry. He has extensive background, both as a government official and a research executive in the private sector, in nuclear planning and policy and in arms control. Mr. Sloss held senior positions in the State Department, the Department of Defense, and the U.S. Arms Control and Disarmament Agency during the 1970s. In 1978 he directed the Nuclear Targeting Policy Review for the secretary of defense. In 1979–1980 he was vice president of SRI International, in charge of its Washington office. He served on two Department of Defense advisory groups examining new approaches to ballistic missile defense in 1982–1983: the Foster Panel and the Hoffman Panel.

Jed C. Snyder is president and founder of the Washington Strategy Seminar, an international security research and discussion forum for younger scholars based in Washington. He is also a consultant to the Office of the Secretary of Defense. Mr. Snyder has held research and management positions at several research institutions, including the Hudson Institute and the Woodrow Wilson International Center for Scholars. Mr. Snyder served in the State Department during the first Reagan administration and was subsequently appointed to (then) Vice-President George Bush's Middle East Advisory Task Force. In 1979–1980 Jed Snyder was assistant division manager at Pan Heuristics, where he worked closely with the Wohlstetters. He studied under Albert Wohlstetter at the University of Chicago.

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Barry D. Watts is a senior analyst at the Northrop Analysis Center in Washington. He flew F-4s in Vietnam, taught philosophy at the Air Force Academy, and retired from the U.S. Air Force in 1986. Mr. Watts served in the Office of the Secretary of Defense (Office of Net Assessment) in 1978–1981 and in 1984–1986. He is the author of *The Foundations of U.S. Air Doctrine: The Problem of Friction in War*.

Jasper A. Welch is a private consultant to government and industry in aerospace technology. He lives in Washington, where he retired from the U.S. Air Force after thirty-one years of service. A physicist, Dr. Welch is a member of the National Academy of Engineering. He held several key acquisition positions in the air force, directed policy studies for the secretary of defense, and was defense policy coordinator for the National Security Council.

Charles Wolf, Jr., is director of international economic research at the RAND Corporation, dean of the RAND Graduate School, and a senior research fellow of the Hoover Institution. He has written numerous books and articles on economic, defense, and foreign policy issues.

Paul D. Wolfowitz is under secretary of defense for policy. He has served in numerous government positions, including U.S. ambassador to the Republic of Indonesia, assistant secretary of state for East Asian and Pacific affairs, and director of the State Department's Policy Planning Staff. Dr. Wolfowitz has been on the faculties of the School of Advanced International Studies in Washington and of Yale University and studied under Albert Wohlstetter at the University of Chicago.



Albert and Roberta Wohlstetter at their home in Los Angeles (1954). Photo by Lerner Irving.



The Wohlstetters thirty-seven years later (Los Angeles, 1991). Photo © 1991 by Marianne Atkinson, reprinted by permission.



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PART ONE

Retrospective

On Not Surrendering to the
Contributions of the Webstersters to
U.S. Strategy and Strategic Thought

REVISED 1977

In 1975 Allen Webster, writing in a little book, *The Webstersters*, said, "The real Webstersters are the Webstersters who are still a student of the doctrine of the active defense theory of the strategic defense." Webster, with his characteristic wit and humor, was saying that the Webstersters were the Webstersters who were still a student of the doctrine of the active defense theory of the strategic defense. Webster, with his characteristic wit and humor, was saying that the Webstersters were the Webstersters who were still a student of the doctrine of the active defense theory of the strategic defense. Webster, with his characteristic wit and humor, was saying that the Webstersters were the Webstersters who were still a student of the doctrine of the active defense theory of the strategic defense.

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PART ONE

Retrospective

1

On Not Confusing Ourselves: Contributions of the Wohlstetters to U.S. Strategy and Strategic Thought

James Digby and J. J. Martin

In 1975 Albert Wohlstetter wrote an article with the provocative title, "Optimal Ways to Confuse Ourselves," that criticized the muddled thinking of proponents of the action-reaction theory of the strategic "arms race," exposing their inconsistencies and the failure of this theory to accord with the facts.¹ Much of the work of Albert and Roberta Wohlstetter is aimed in one way or another at clarity of thought about matters of great importance for national security. We are fortunate they lived at a time when the great powers were reshaping their security strategies to take nuclear weapons into account. The world is safer because the Wohlstetters devoted their intellects, scholarly habits, intense curiosity about complex problems, expositional powers, and insistence upon clear thinking to this problem.

The Wohlstetters bring a kind of synoptic scholarship to security studies that is rare in American thought. Indeed, it may be inconsistent with the nature of their work to summarize their contributions in terms of discrete categories as is done below. In addition to fundamental contributions to clear thinking about strategic matters, the Wohlstetters have had major influence in exposing unappreciated U.S. strategic vulnerabilities; they have shaped the theory and practice of deterrence; they have been leading exponents of concepts and systems that allow U.S. political authorities to maintain enduring control over military operations; and they have been strong advocates of military technologies of discrimination and control and of strategic defenses. At the same time, they have resolutely opposed the spread of technologies of mass destruction, most notably the proliferation of nuclear weapons.

Clarity of Thought

It was natural for Albert, whose university studies were in mathematical logic, to insist upon precise definitions, the correct use of terms, rigorous reasoning, accurate data, and detailed empirical investigation in strategic studies. But the Wohlstetters went well beyond these basic elements of clarity to expose the subtle ways in which confused ideas, obsolete concepts, and even organizational structures have influenced strategic thought to its detriment. For example, Albert has long criticized many advocates of arms control for their confused thinking that in the name of stability opposes the incorporation of advanced technologies into weapon systems. Contrary to assertions about the destabilizing nature of new military technologies, Albert showed that improvements in accuracy permit use of lower-yield nuclear weapons or even nonnuclear warheads, adding to the ability to keep wars under control through discriminate responses to attacks. Moreover, the new technologies of information gathering and handling permit these discriminate responses to be militarily effective.

An example of an obsolete concept that Albert no doubt would argue was never a good idea is the transformation of Giulio Douhet's notions about strategic bombing into the modern doctrine of mutual assured destruction (MAD). The deceptively simple idea that a U.S. ability to destroy Soviet cities is sufficient to deter wars, enforce responsible behavior, and stabilize the arms race has had pernicious influence on U.S. policies and forces. Albert Wohlstetter has been unsparing in his efforts to expose the fallacies of this reasoning.²

Albert and Roberta also have been influential in showing how institutional arrangements lead to compartmented thinking. One example is the way that the organization of U.S. intercontinental nuclear forces under the Strategic Air Command (SAC) inhibited American planners from thinking about their use in theater wars. This tendency is reinforced by the institutionalization of strategic arms control talks in channels that are separate from negotiations on theater nuclear and conventional forces. Organizational arrangements also can affect planning for regional contingencies. For example, Turkey is part of the North Atlantic Treaty Organization (NATO). As a result, until Albert Wohlstetter called attention to the proximity of eastern Turkey to the Persian Gulf, U.S. planners had not seriously considered using forces based in Turkey to oppose attacks on countries in the Persian Gulf region.

The Wohlstetters' style of thought is reminiscent of that which characterized RAND in its early years. Indeed, the Wohlstetters both influenced and were influenced by the early RAND style of thinking.

This approach to strategic studies is at once eclectic and synoptic—eclectic in that it focuses not only on military forces and characteristics, but also on the adversary and on relevant political, economic, technological, and operational considerations; synoptic in that it brings all these considerations together into a coherent and relevant treatment of the problem under study. An example is Roberta's analysis of ambiguous warning of attacks and the work of both Albert and Roberta on the sometimes subtle connection between the effectiveness of the adversary's ability to mask preparations for war and the ability of the United States and its allies to respond repeatedly to ambiguous warning.

The Wohlstetter style of thought also emphasizes understanding what the real problem is, rather than accepting uncritically the question as it may initially be formulated by the sponsoring government office. Neither the SAC basing studies of the 1950s nor the nuclear proliferation work of the 1970s would have been as influential had Albert and Roberta not devoted considerable attention to proper definition of the issues.

Other characteristics of the Wohlstetter manner of thought are equally important. One is continuity of concepts across many diverse types of military problems. Albert has, for instance, pointed out that the capability for controlled, discriminate military responses is as important in low intensity conflict as it is in nuclear war. Another characteristic is a strong interest in improved methodologies, as illustrated by the way that Albert's SAC basing studies contributed to the development of the discipline of systems analysis at RAND. Finally, there is Albert's unique literary style, which makes his work a delight for his peers and students to read: grand while also precise, lucid even when dealing with complex matters, witty, and sometimes combative.

Indeed, Albert can be fierce in exposing the errors of those who persist with sloppy thinking, especially if they also are confusing others. The 1974–1977 series of articles about legends of the strategic arms race is a case in point. The 1983 article, "Bishops, Statesmen, and Other Strategists on the Bombing of Innocents," which disputed the position of the Catholic Church on nuclear deterrence, is another.³

Unappreciated Strategic Vulnerabilities

The insistence of the Wohlstetters on clear thinking led to their revealing unappreciated or underappreciated vulnerabilities in U.S. and allied forces and strategies. The basing study was seminal in this regard.

In his examination of the basing of SAC bombers, Albert showed how devastating an attack could be if it were designed to destroy the Strategic Air Command itself, not just to hit SAC targets in support

of an attack directed primarily at destroying steel, oil, and chemical plants. He had examined the kind of Soviet attacks assumed in the secret analyses of the Net Evaluation Subcommittee of the National Security Council and noted that so many targets were attacked that a huge fleet of Soviet bombers was required to come over the pole. Instead, Wohlstetter hypothesized small attacks that minimized the warning available to the Strategic Air Command. These attacks could destroy the vast majority of SAC bombers before they could be armed and launched.

Albert's minimum-warning attack broke with past convention and was one of a number of new ways of looking at strategic air power issues resulting from his agreeing in 1951 to lead a RAND study of how SAC bombers should be based.⁴ While in Santa Monica, both Wohlstetters met several old friends who worked at RAND and who persuaded Roberta to come there on a part-time basis. In early 1951 Albert became a consultant and studied several methodological problems relating to logistics. Then in May 1951, Charles Hitch, head of RAND's Economics Division, posed a problem about basing that came from the air force.

Albert later observed that he first thought the problem a bit dull, but, after considering it over a weekend, decided that he could learn about nuclear war in a concrete way and that the problem Hitch posed would raise a number of interesting issues. The study, as he later formulated it, had two objectives: "First, it is an analysis of how to look at bases—an examination of the critical factors in strategic-base selection. Second, it is an application of the analysis to the basing of the 1956–1961 bomber force."⁵

As Albert carried out the analysis of where to base SAC bombers, he noted that there were considerations making it useful to base close to the enemy and opposing considerations making it useful to be far away. He later elaborated on this concept in an elegant paper, "Theory and Opposed Systems Design."⁶

Methodological advances were by no means the only result of the basing study. This work resulted in the withdrawal of SAC bombers from overseas bases and developed ways to reduce the prelaunch vulnerability of these forces, including the fail-safe launch concept, in which SAC bombers are launched upon warning of attack, but are not irrevocably committed to nuclear strikes on the USSR. The bomber basing study and its extensions evaluated the vulnerability of SAC forces to the electromagnetic pulse effects of nuclear attacks, assessed the consequences of nuclear blackout for SAC communications, and introduced the idea of silo-basing for intercontinental ballistic missiles (ICBMs).

Albert's concept of designing Soviet attacks to exploit U.S. vulnerabilities led over time to other important work by the Wohlstetters, including the analysis of NATO vulnerabilities. Albert helped focus U.S. and NATO conventional force planners on short-warning attacks, in which the Soviets would seek to conceal their preparations for war or to shroud them in ambiguity until the last possible moment. In the late 1960s he called attention to the possibilities of Soviet attacks on NATO that would have limited objectives intended to take advantage of latent cracks in NATO's unity. Through such analyses Wohlstetter exposed weaknesses on NATO's northern and southern flanks that could be exploited by the Soviet Union without attacking the central front. This line of reasoning caused him to question the almost exclusive focus of U.S. and NATO planners on two relatively unlikely contingencies: an unrestrained Soviet nuclear attack on the United States and a large Warsaw Pact conventional attack in Central Europe. As a result of this work, planners began to broaden their attention to include lesser, but more likely, nuclear and conventional attack scenarios.⁷

Albert and Roberta have been instrumental in bringing other vulnerabilities to the attention of U.S. leaders. In a study for the Office of the Secretary of Defense carried out in the late 1970s they made clear that, while the United States was not critically dependent on access to oil and natural gas in the Persian Gulf, U.S. allies in Europe and the Far East were and that vulnerabilities in the Persian Gulf affected U.S. alliance relationships. This analysis went on to show the errors of the then-current assumption that U.S. capabilities to project power in Southwest Asia were superior to those of the USSR. American analysts had failed to take into account gradual changes in political alignments between 1950 and 1980 that cumulatively resulted in substantially increased Soviet overflight rights and base access in the region and seriously decreased U.S. access, dramatically shifting the power projection balance over that period. The ease with which the Soviets invaded Afghanistan in 1979 and the inability of the United States to make direct military responses vividly illustrated this point.

Concepts of Deterrence

While most systems analysts would have been content to recommend major improvements in the basing of SAC forces, Albert Wohlstetter did not stop there. He generalized from the details of the basing study to devise a fundamentally new concept of nuclear strategy in the late 1950s: second-strike deterrence. He showed that what matters for deterrence is not the forces the United States has before a war starts, but what survives a Soviet first strike. Thus, the survivability improve-

ments the Strategic Air Command made as a result of the basing study enhanced deterrence by increasing U.S. second-strike capabilities.

By the mid-1960s a particular form of the second-strike concept, mutual assured destruction, had become the heart of Robert McNamara's strategic force doctrine in the Pentagon, had powerfully influenced the views of Western Europeans about NATO's force posture and strategy, and was the assumption underlying most academic treatments of nuclear arms control. According to the MAD doctrine, it is sufficient for U.S. strategic forces to be able to destroy Soviet cities in a second strike and destabilizing for U.S. strategic offenses or defenses to prevent Soviet nuclear forces from destroying U.S. cities.

Albert Wohlstetter deplored the idea that a U.S. second-strike capability against Soviet cities was sufficient to deter a host of Soviet attacks, large or small, nuclear or conventional. He argued that lesser attacks, including Soviet conventional attacks on U.S. allies, must be met with credible military responses that are not suicidal for the United States or its allies. That is, U.S. responses to attacks must leave the enemy with a continued stake in prudent behavior, otherwise the enemy would have no recourse but to counter with unrestrained nuclear attacks against U.S. cities. Indiscriminate, suicidal nuclear responses to lesser attacks simply are not credible deterrents.

Albert went on to develop two corollaries. One was that the United States should be able to vary its military response to match the circumstances of the provocation. The other was that the growing Soviet capability for selective use of force in the 1970s could only be countered by U.S. and allied capabilities for selective, discriminate responses.

The ability to vary response with circumstances is closely related to the problem of how to deal with ambiguous signs of enemy preparations to attack. Roberta Wohlstetter made a definitive study of this problem in the 1950s.

The daughter of a noted Harvard law professor who introduced into American legal codes a more sophisticated concept of evidence, Roberta no doubt was struck when she first came to RAND by the imprecision with which momentous events were described. With this background she was well disposed toward a proposal by Andrew Marshall that she undertake a major study of the warning indicators of Japan's attack on Pearl Harbor, how these were received and processed by the United States, how American decision making worked then, and how it might work in similar circumstances in the era of the H-bomb.

Mrs. Wohlstetter's analysis led her to reject the darker theories of those who claimed there was a conspiracy at the highest levels of the U.S. government to ignore clear warning signals. Instead, she found

that the indications of attack then, and those America might have in the future, were inherently ambiguous. She noted that,

If we accept the fact that the signal picture for impending attack is almost sure to be ambiguous, we shall prearrange actions that are right and feasible in response to ambiguous signals, including signs of an attack that might be false. We must be capable of reacting repeatedly to false alarms without committing ourselves or the enemy to wage thermonuclear war.⁸

This careful and difficult case study was an appropriate sequel to the analysis of surprise attacks led by Albert in the basing study. It helped to anchor deterrence theory in the real world of partial and incomplete information, and, because responses should suit the situation, it led the two of them to reflect on the need for enduring control over military operations.

Enduring Control

An important implication of the need to be able to vary the response in ways appropriate to the circumstances is that political authorities must be able to maintain enduring control over military forces and operations—during crises, during the fighting, and after the fighting is over. Albert Wohlstetter's concept of enduring control highlights the need for political authorities to be able to defend against attacks while lowering the risk that the war will escalate to higher levels of violence. This idea applies to nuclear war, conventional war, and low intensity conflict.

Enduring control has several requirements. One is accurate information about what actually is going on in the crisis or war. Albert Wohlstetter has long been interested in surveillance technologies for this reason. An early example is his proposal that led to the bomb-alarm system, a network of sensors to confirm that a nuclear attack was underway against critical U.S. targets. Another requirement is detailed military doctrines and plans to respond with suitable, but not excessive, force. The fail-safe launch concept is a controlled way of responding to ambiguous sensor warning of attacks on SAC bomber bases. Under this doctrine, which was incorporated into SAC plans, bombers are launched upon receipt of warning, allowing them to escape the attack. They proceed toward enemy targets up to a certain point, but return unless they receive explicit authorization to strike after U.S. political authorities have verified that an attack occurred, determined its source and extent, and decided what targets should be struck in

retaliation. Another example is Wohlstetter's dual-criterion targeting doctrine, which became part of U.S. and NATO nuclear weapons targeting plans in the 1970s. Here, aimpoints for nuclear weapons are selected to satisfy two criteria simultaneously: to achieve a specified level of military damage and to minimize damage to the surrounding civilian area.

Appropriate command and control capabilities also are needed for enduring control. Arrangements must be in place to keep the forces from taking unauthorized military actions that might escalate the crisis or war. In this regard, Albert, working with Fred Iklé, contributed to the concept of permissive action links, which are electro-mechanical locks on U.S. theater nuclear weapons that prevent a nuclear explosion unless the commander inserts the proper code.

Reliable communications with military forces are another requirement for exercising enduring control. Albert called attention to the importance of communications systems that are resistant to electromagnetic pulse effects and can function during periods of nuclear blackout (temporary ionospheric disruptions, caused by nuclear detonations, that could interfere with high-frequency communications). Similarly, he has long opposed the unwarranted assumption that space-based communications and surveillance satellites would be in sanctuary during any but an unrestrained nuclear war; he has argued that military satellite systems should be designed to support vital control functions even if these systems were themselves attacked.

But doctrine, plans, and command and control are not enough. Enduring control further requires that weapon systems themselves be capable of discriminating strikes. High accuracy is essential in this regard. A very accurate missile can cause the same damage as a less accurate one, but with a lower-yield nuclear warhead or, at extreme accuracies, with a nonnuclear warhead. Moreover, precision delivery allows an attack to achieve damage objectives with fewer weapons than if missiles with less accuracy were used. The use of lower-yield warheads and fewer missiles would reduce civilian casualties and other unwanted damage.

Advocates of mutual assured destruction opposed the efforts of Albert and others to improve the accuracy of U.S. missiles, arguing that more-accurate missiles would threaten Soviet second-strike capabilities and cause an arms race. Albert fought this theory, pointing out that the United States would not be the aggressor in a war with the Soviet Union, but that precision delivery was essential to respond discriminately to Soviet attacks by accomplishing the needed military damage with little or no damage to nearby civilian areas. As part of this debate Albert wrote his extensive series of articles exposing the

myths of the strategic arms race, showing that most upgrades to U.S. strategic forces were responses to increased Soviet threats, not vice versa.

The ability of political authorities to maintain enduring control over their military forces was a central issue in the Cuban missile crisis. During this crisis Albert and Roberta provided a series of insightful memoranda to Henry Rowen and Paul Nitze, who were in the Department of Defense at the time. Albert was also invited to sit on the Quarantine Committee. Although earlier the Wohlstetters had argued against putting Thor and Jupiter intermediate-range ballistic missiles in England, Italy, and Turkey because they were so vulnerable to attack, Albert did not advise taking them out as a response to Soviet removal of missiles from Cuba; he thought the timing was wrong. Moreover, he felt that the confusing signals that came out of U.S. handling of this issue gravely hurt relations in Turkey. Later, in 1965, Albert and Roberta illustrated their concepts of ambiguous warning, varying response with the circumstances, and enduring control in a case study of the Cuban missile crisis.⁹

Technologies of Discrimination and Control

Technology is a traditional American strength, and Albert Wohlstetter's work has sought to use new technologies to enhance deterrence and improve the U.S. position in the military competition with the Soviet Union. Early examples of his interest in the military applications of new technologies include sensors for real-time assessment of nuclear attacks, materials and structures technologies for hardening ICBM silos against nuclear attacks, and electronic and cryptographic technologies for permissive action links on theater nuclear weapons.

A major motivation for Wohlstetter's interest in technology was his concept of discriminate, controlled military responses to attacks. Consequently, he has been a leading advocate of technologies to improve missile accuracy. Albert was instrumental in the 1970s and 1980s in promoting near-zero CEP (circular error probable) cruise missiles to provide the capability for effective long-range strikes with nonnuclear warheads. Cruise missiles with such accuracy are made possible by several technologies developed under the auspices of the Defense Advanced Research Projects Agency (DARPA): laser-radar, on-board computers that analyze terrain features for precise navigation enroute to the target, and very accurate terminal-homing techniques in the target area. Albert also has been a strong promoter of satellite technologies developed by DARPA that contribute to enduring control over military operations. One of these is blue-green laser technology

that enables reliable two-way communications between submarines and satellites, with very low risk that the submarine can be located by enemy communications-monitoring systems. Another is packet-switching communications technology, which permits deployment of networks of small, low-cost satellites that can automatically adjust their operations to compensate for damage and whose performance would therefore degrade slowly under attack.

Ballistic missile defense is a controversial class of technologies whose use Albert Wohlstetter has long supported, particularly for protection of strategic forces, command and control, and other military installations. Active defenses, combined with passive defense techniques such as hardening or mobility, can improve the survivability of the U.S. second-strike deterrent and protect the means for controlling U.S. responses. In 1969 Albert testified before Congress in support of the Safeguard antiballistic missile (ABM) system and thereby became involved in an extensive debate with George Rathjens and other scientists about the vulnerability of Minuteman ICBMs and the need for the Safeguard system to protect Minuteman. Rathjens and the others maintained that Minuteman was not as vulnerable to Soviet attacks as the Department of Defense claimed, while Wohlstetter argued to the contrary. The debate revolved around details of attack scenarios and vulnerability calculations, and became vitriolic at times. Albert felt that his opponents seriously violated professional standards of analysis and asked the Operations Research Society of America to inquire into the practices and ethics of those involved. The society carried out an extensive examination of the conflicting congressional testimony, confirming Wohlstetter's calculations and finding that the analyses of his opponents "... were often inappropriate, misleading, or factually in error."¹⁰

Thus, Wohlstetter promoted higher professional standards of analysis and expert testimony before Congress. But more was at stake in the ABM debate of 1969. On this occasion and others Albert opposed the efforts of arms control advocates to restrain military technology by bans or limits on strategic defenses, underground nuclear testing, missile test flights, or accuracy improvements. Not only would such restrictions allow the Soviet Union to shift the military competition away from technological quality, where the United States has major advantages, but it would seriously impede U.S. efforts to make the use of military force more discriminate and controllable. Wohlstetter argued that, if technology had been limited by treaty in the past, both the United States and the Soviet Union would have been prevented from making their nuclear weapons safer, from reducing the potential of these weapons to kill civilians while striking military targets, and from

shifting their military force postures away from dependence on nuclear weapons. Arms control positions that oppose the reduction of risks to innocent civilians have always seemed perverse to Albert Wohlstetter.

Nuclear Weapons Proliferation

The spread of nuclear weapons to other countries, especially smaller nations that are not as politically stable as the superpowers, is an application of technology that is directly contrary to the concepts of discrimination and control espoused by the Wohlstetters. It is not surprising, therefore, that they have been as vigorous in opposing nuclear weapons proliferation as they have been in promoting technologies of precision delivery, command and control, survivability, and defense.

During the 1950s three countries had nuclear weapons and the capability to attack other countries with them: the United States, Great Britain, and the Soviet Union. The prospect that more countries would have nuclear weapons began to concern the Wohlstetters and others at RAND at that time. There were a number of stimuli, including the treatises of the British scientist C. P. Snow, pamphlets of the Committee on Nuclear Disarmament, and a paper of the National Planning Association. Undoubtedly more important in focusing the views of the Wohlstetters on proliferation was the growing interest during the early 1960s in the multilateral nuclear force, a concept in which European nations would share nuclear weapons under NATO auspices. Albert Wohlstetter argued against this idea, summarizing his thoughts in an article entitled, "Nuclear Sharing: NATO and the N+1 Country."¹¹

The Wohlstetters increased their attention to nuclear proliferation with the formation of a working group of the Southern California Seminar on Arms Control and Foreign Policy in 1970,¹² and it became a central topic of their work when they formed their own research organization, Pan Heuristics. The U.S. Arms Control and Disarmament Agency awarded Pan Heuristics a contract in 1974 to study nuclear weapons proliferation, which resulted in the influential report, *Moving Toward Life in a Nuclear Armed Crowd?*¹³ This was the first of a series of pioneering studies by the Wohlstetters and their colleagues at Pan Heuristics that invalidated a number of widely held beliefs about the nuclear fuel cycle and nuclear weapons: that plutonium recycled for power reactors was economically attractive; that international safeguards on the possession of plutonium could prevent its use in nuclear weapons; and that nuclear explosions had practical civil uses, as proposed in the deceptively named Project Plowshare.

In summing up this research, which was an interesting extension of the concept of ambiguous warning, Roberta Wohlstetter elegantly and readably described the complex set of misconceptions that allowed India to surprise the rest of the world when it exploded a nuclear device.¹⁴ And Albert gave voice to the concerns about commercial activities that would make plutonium or highly enriched uranium "widely accessible to many governments and quickly useable in nuclear explosives" in a remarkably comprehensive statement at a formal hearing in 1977 on the proposed Windscale reprocessing plant in England.¹⁵

By their energetic and forceful communication of these carefully researched findings the Wohlstetters paved the way for the Nuclear Nonproliferation Act of 1978, leading Fred Iklé to say in the preface of a book summarizing the results of the Pan Heuristics research:

Rarely has scholarly research been so immediately influential for changing government policy. This study, far more than any others on this topic, revolutionized the thinking in the United States (and in other countries as well), leading the way to the radical new departure in U.S. nonproliferation policy that took place during the Ford administration. . . . The Carter administration's policy . . . essentially incorporated this "revolution."¹⁶

Influence of the Wohlstetters

As their work on nuclear weapons proliferation makes clear, Albert and Roberta Wohlstetter know that arriving at important research results is not sufficient to influence government policies. The results must be communicated to policy makers in a clear and convincing way, so that the importance of the problem is appreciated and the solution is understood. Further, potential opponents in the Department of Defense, the Congress, and allied countries should be persuaded in advance of publication of the results whenever possible.

Consequently, the Wohlstetters have spent much time with senior policy makers, congressmen, and military people discussing strategic issues through private meetings and memberships on government advisory boards. Moreover, they have been creative in organizing other venues for the discussion of policy issues. For many years Albert chaired the New Alternatives Workshop, a forum sponsored by the Department of Defense in which policy makers, scientists, academics, and military officers discussed current national security policy issues. The Wohlstetters are also leaders in the European American Institute for Security Research and the Security Conference on Asia and the Pacific, which

are similar means for exchanging views with government officials and other influential people in allied countries.

Through these worldwide interactions Albert and Roberta have been instrumental in setting the U.S. and allied security agendas since the late 1950s. They often have been in advance of the popular problems of their day, defining the next set of major issues for government attention. The vulnerabilities of SAC forces, the problems of projecting U.S. military power to the Persian Gulf, and the role of overseas nuclear power plants in nuclear weapons proliferation are notable examples.

Pathfinders of nuclear strategy, visionary scholars, and advisers to secretaries of defense, the Wohlstetters are also teachers. Albert was a University Professor at the University of Chicago for fifteen years, a professor at the University of California in Los Angeles and in Berkeley, and a fellow at All Souls College, Oxford. Roberta taught at Howard University, Barnard College, and the University of Chicago. Many of their students now occupy influential posts in government, on congressional staffs, and in research organizations. Through them, perhaps more than any other way, the Wohlstetters continue to keep American policy makers from being confused about issues of fundamental importance.

Notes

1. Albert Wohlstetter, "Optimal Ways to Confuse Ourselves," *Foreign Policy*, no. 20 (Fall 1975), pp. 170-98.

2. For further discussion of problems with the doctrine of MAD, see chapter 3.

3. Albert Wohlstetter, "Bishops, Statesmen, and Other Strategists on the Bombing of Innocents," *Commentary*, vol. 75, no. 6 (June 1983), pp. 15-35.

4. *Selection of Strategic Base Systems*, RAND Report R-244-S (Santa Monica, Calif.: RAND, March 1953). Distribution of this report is limited to scholars and government agencies.

5. Albert Wohlstetter, Fred S. Hoffman, Henry S. Rowen, and Robert Lutz, *Selection and Use of Strategic Air Bases*, RAND Report R-266 (Santa Monica, Calif.: RAND, April 1954), p. v (this was a more complete report than R-244-S, intended for wider circulation among cleared personnel). See also Albert Wohlstetter, Fred S. Hoffman, and Henry S. Rowen, *Protecting U.S. Power to Strike Back in the 1950s and 1960s*, RAND Report R-290 (Santa Monica, Calif.: RAND, August 1956), for an extension of the original bomber basing study.

6. Albert Wohlstetter, "Theory and Opposed Systems Design," *Journal of Conflict Resolution*, vol. XII, no. 3 (September 1968), pp. 302-32, and in *New Approaches to International Relations*, ed. Morton A. Kaplan (New York: St. Martin's Press, 1968), pp. 19-53.

7. *Discriminate Deterrence*, Report of the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, January 1988), pp. 33-37.
8. Roberta Wohlstetter, *Pearl Harbor: Warning and Decision* (Stanford, Calif.: Stanford University Press, 1962), p. 401.
9. Albert Wohlstetter and Roberta Wohlstetter, *Controlling the Risks in Cuba*, Adelphi Paper no. 17 (London: International Institute for Strategic Studies, April 1965).
10. Operations Research Society of America, "Guidelines for the Practice of Operations Research," *Operations Research*, vol. 19, no. 5 (September 1971), pp. 1176.
11. Albert Wohlstetter, "Nuclear Sharing: NATO and the N+1 Country," *Foreign Affairs*, vol. 39, no. 3 (April 1961), pp. 355-87.
12. Later called the California Seminar on International Security and Foreign Policy.
13. Albert Wohlstetter et al., *Moving Toward Life in a Nuclear Armed Crowd?* Report to the U.S. Arms Control and Disarmament Agency (Los Angeles: Pan Heuristics, April 22, 1976).
14. Roberta Wohlstetter, "U.S. Peaceful Aid and the Indian Bomb," in *Nuclear Policies: Fuel Without the Bomb*, ed. James Digby, A Policy Study of the California Seminar on Arms Control and Foreign Policy (Cambridge, Mass.: Ballinger, 1978), pp. 57-72.
15. Albert Wohlstetter, "Must We Decide Now for Worldwide Commerce in Plutonium Fuel?" in *Nuclear Policies: Fuel Without the Bomb*, pp. 21-56.
16. Fred Charles Iklé, "Foreword," in Albert Wohlstetter et al., *Swords from Plowshares: The Military Potential of Civilian Nuclear Energy* (Chicago: University of Chicago Press, 1979), p. vii.

2

Contributions of RAND to Strategy in the 1950s

James Digby

A Birthday Feast for Albert

Roberta and Albert Wohlstetter were great influences in the early years at RAND in helping the rest of us to appreciate the finer things and in bringing to our bright, but miscellaneous, group some degree of urbanity. For example, they organized afternoons of chamber music at their home and led us through explorations of modern architecture.

By the mid-1950s I had come to know both well, and had hypothesized Soviet radar networks for Albert's bomber study and worked with him to design his famous sneak attacks on SAC. Late one year Roberta proposed a birthday feast for Albert. It was held at Holiday House, a Malibu restaurant designed by Richard Neutra, located on a hill overlooking the Pacific. Holiday House was owned by the pleasant but often vague Dudley Murphy, a former film director and acquaintance of theirs. Murphy had acquired the services of an excellent young chef, Joseph Hyde, who sometimes threatened to quit because Murphy would forget to buy propane or other essentials.

About eight of us were there, probably including the Hitches, the Rowens, the Marshalls, and my friend Pat Keith. The food was great, but the wines even greater. I remember a 1924 Chateau Ausone, a 1937 Chateau d'Yquem, and a good white Burgundy—probably a Meursault.

The point of telling this little story—besides its bringing back good memories—is to note the way Roberta and Albert have led the way for generations of us in the art of civilized association and the appreciation of good food, of good wine, and of intellectual fellowship.

* * *

Not many people at RAND in the late 1940s and early 1950s thought of themselves as strategists, and this included Albert and Roberta

Wohlstetter. Most members of the RAND staff thought of their jobs as being the application of science to the problems of the U.S. Air Force in the tradition of Sir Robert Watson-Watt, Lee Dubridge, and Louis Ridenour. On the other hand, they were well aware of the methodological advances of early operations researchers like Philip Morse.

For example, a few months after Albert Wohlstetter became a RAND consultant in 1951, Charles Hitch¹ posed a problem to him that had interesting methodological challenges: How should the Strategic Air Command (SAC) base its bombers? While Wohlstetter's work on this problem had a major effect on U.S. strategy, he initially agreed to undertake the study because he would learn a great deal about nuclear war and because the problem involved forces working in opposing directions, with consequent opportunities for the innovative use of logic.

I first heard stories about Albert in 1949, when I met Roberta Wohlstetter. RAND's offices at a former Douglas Aircraft Corporation site had cubicles partitioned to a height of some seven feet and painted in "Douglas green." Across the way from my desk a cubicle was labelled "R. Wohlstetter; A. Kaplan," and a stream of fluent German was sometimes heard. I presumed the German was emitted by Wohlstetter and the attractive lady was Mrs. Kaplan. But it did not take long to learn that the German came from Abraham Kaplan, later to achieve some fame as a philosopher, and the lady was Roberta Wohlstetter. She told luncheon companions about her meticulous husband, Albert, who would fiercely refuse to let her handle his phonograph records. Much later I would learn that Albert's father had been an early maker of Rex grammaphones and his uncle the physician of the Metropolitan Opera. But I never learned if Albert cited these qualifications while guarding his records.

At that time Roberta Wohlstetter was producing a series of thoughtful reviews of selected publications from the postwar intellectual cascade. A bit later she was to make fundamental contributions to the subject of how the military should regard information and analyze intelligence.

The Intellectual Ferment of RAND

Citing these anecdotes is a way to make two points: first, RAND in its early days was a meeting place for highly individualistic characters and, second, many had extremely active and innovative minds. A third point is even more relevant: early management brought in people with a wide variety of backgrounds, but almost always of sparkling intellects. These were confident people—they had won top prizes and scholarships

in college. And they were ready to put their talents to work for important public sponsors.

Before Albert Wohlstetter decided to become active at RAND, not only certain old friends, but also Roberta told him about the intellectual ferment there. Some of the early important figures were John Williams, astronomer and mathematician, who headed the Mathematics Division; Hitch, who had been a very young don at Oxford, then worked on targeting during the war; and Hans Speier, a wartime propaganda analyst who headed the Social Science Division.

Systems Analysis

Edwin W. Paxson, Jr., was a key figure in bringing mathematical methods of analysis to bear on military problems whose outcomes were dependent on economic factors, natural phenomena, and political and social factors, as well as on future technologies. A mathematician with a Ph.D. from the California Institute of Technology, Paxson had omnivorous interests and a talent for putting his complex subject matter into vivid words, quick sketches, and color charts on poster board. One of his early projects was to show how a wide variety of factors impacted on the choice of a new generation of bombers. This project involved dozens of RANDites in some degree and capitalized on the specialty of the Aircraft Division, which was to design aircraft whose main features were represented as variables in design equations. Paxson decided to call this kind of wide-ranging investigation *systems analysis* in his 1949 report to the air force.

Meanwhile, a rather more careful and even more complex systems analysis was being organized by Edward J. Barlow, a radar engineer with wide-ranging interests. It addressed the design of an air defense system for the United States, a matter that was regarded as urgent, given the post-war hostility of the Soviet Union, its acquisition of the atomic bomb, and its long-range bomber force buildup.

RAND Begins to Reconsider Military Strategy

As these broad studies progressed, the RAND leaders came closer and closer to the examination of military strategy. Paxson encouraged his colleagues to read works on strategy by the Chinese general Sun Tzu and by Clausewitz. A group of emigres from Princeton and the Applied Mathematics Panel (including Paxson) imported the German General Staff's game of blind chess, *Kriegspiel*. Hitch led his economists into explorations of bombing strategy, which he had begun to analyze during the war. Despite these forays, when Albert Wohlstetter began

his basing study in 1951, most senior RAND people saw themselves as interested in air strategy, but not as creators of air strategy.

In 1951, however, Bernard Brodie arrived at RAND with the specific intent of developing an air strategy. Brodie, whose introduction to the military was his service in the Illinois National Guard's cavalry, wrote his doctoral dissertation, *Sea Power in the Machine Age*, under the war analyst Quincy Wright at the University of Chicago. He also wrote on strategy while at the Institute of International Studies at Yale and briefly worked in the Pentagon at the urging of General Lauris Norstad. At RAND, Brodie soon joined an interdivisional team to explore the implications of the newly conceived hydrogen bomb. He also began writing chapters for his planned book, *Strategy in the Missile Age*.

While Brodie's move to RAND gave its staff a recognized scholar of strategy, his reception in the main work of RAND was mixed. Most senior project leaders enjoyed his company at lunch and respected his knowledge of politics and history, but his output was hard to use in a carefully constructed logical analysis of air force problems. Albert Wohlstetter referred to the *belles lettres* approach of Brodie and certain of his colleagues in the Social Science Division. And the succinct RAND economists deplored the layers of conditional clauses and general wordiness of much of the writing issuing from this division's staff. (Economics was not a social science in the RAND lexicon of the 1950s.) Thus, many of the contributions to strategy that came out of the RAND work of this period resulted from the synthesis of ideas about specific problems, as illuminated by a knowledge of politics, economics, and history. The senior people were usually solving problems, not searching for broad principles.

The Second-Strike Theory of Deterrence and the Importance of Reducing Vulnerability

It was characteristic of this approach to strategy through the study of more detailed military issues that Albert Wohlstetter formulated an important principle of air strategy while working on the specific problem of appropriate ways to base SAC bombers: the second-strike theory of deterrence. He and his team, in a long series of detailed briefings, stressed that deterrence depended on a protected, high-confidence capability to strike back even after a well-designed Soviet nuclear strike had hit our own forces.² He called this a second-strike capability.³ A corollary was the profound importance of decreasing the vulnerability of the force that was needed to strike back. The team pointed out graphically the ways in which the then-programmed strategic force could be decimated by even small Soviet attacks if they were sensibly designed

to concentrate on destroying the Strategic Air Command. The air force's "Mobility Plan" at the time envisaged flying SAC units with their equipment to overseas bases, then conducting repeated strike missions from those bases. Wohlstetter's team found that this plan would be easy for the Soviets to disrupt and devised alternative ways of operating that would decrease vulnerability while maintaining the ability of the Strategic Air Command to penetrate Soviet defenses and destroy targets.

The understanding that surviving a Soviet attack, surviving again in the air, and destroying targets *all* counted led to a number of specific suggestions, including the proposal, later accepted by the Strategic Air Command, that overseas bases serve primarily as refueling points. This proposal not only reduced SAC vulnerability, but also saved a great deal of money in construction and logistics stocks.

Meanwhile, the engineers and physicists at RAND were reexamining many of the technical aspects of air force weapons, sometimes in conjunction with system analyses, sometimes independently. One RAND proposal would have far-reaching consequences: Missiles Division physicist Bruno Augenstein came up with the idea that nuclear warheads could weigh as little as 1500 pounds, yet have enough yield to be effective at miss distances as large as three miles. He proposed a number of changes to make more practical the air force's Atlas missile and briefed these in late 1953 to a committee chaired by John von Neumann. The committee adopted most of these suggestions, and urgent work began in 1954 on what came to be called the intercontinental ballistic missile (ICBM).

Thus, when Wohlstetter's team went on to consider SAC basing for the late 1950s and the 1960s, both the threat and U.S. forces included ballistic missiles. This second basing study, *Protecting U.S. Power to Strike Back in the 1950s and 1960s*, recommended some fifty specific measures for improving U.S. power to strike back.⁴ It looked into alternative warning schemes, protecting command, control, communications, and intelligence (C³I), speeding the responses to warning, and ways to deal with ambiguous warning. Consultants were added to the team to design protective shelters for essential systems. Most notably, the team proposed the use of underground silos for ICBMs, with relatively small, strong doors. The study also proposed a fail-safe launch of bombers, whereby they would take off on receipt of warning, but later return to base unless they received an authenticated order to continue on to their targets.

Ambiguous Information and Intelligence

While Albert Wohlstetter led his team in their studies of strategic operations, Roberta Wohlstetter carried out her own careful analysis

of how military systems use ambiguous information. In the mid-1950s, RAND analyst Andrew Marshall, who had become interested in improving the use of intelligence data, suggested a study of the 1941 attack on Pearl Harbor, which "... provides a dramatic and well-documented example of an attack presaged by a mass and variety of signals, which nonetheless achieved complete and overwhelming surprise."⁵ Roberta Wohlstetter's work, which won a Bancroft Prize, was not only a careful recounting of what happened in 1941 and the years before, but was also a more general investigation of the detection of intelligence signals and how these signals were used from the moment they were picked up through the subsequent sequence of actions or inactions. As she put it: "What does Pearl Harbor tell us about the possibility of a surprise attack today—with possible consequences of an even greater, and perhaps fatal, magnitude?"⁶ She pointed out that noise is common in any military warning system. The important thing is to take sensible action on the basis of necessarily ambiguous information.

Marshall himself made some important observations on this topic a few years earlier. In 1952, he and I visited Headquarters, U.S. Air Force, Europe, to analyze the use of such intelligence indicators of Soviet attack as cancelled leaves, changes in train traffic, and changes in signal intercepts. Marshall devised a new approach to using indicator intelligence. Instead of the old "Condition Green," "Condition Yellow," or "Condition Red," responses that were designed for self-protection, he said that Western responses should also affect the behavior of the enemy. He pointed out that it was important to estimate the cost of responses and the value of their effect. In later years Marshall continued to develop his ideas about responsive adversaries and the need to look at intelligence questions in a two-sided way. His resulting concept of net assessment caught on rapidly throughout the national security establishment after he became a government official in the early 1970s.

Albert Wohlstetter and his team were well aware of Marshall's work and, of course, of Roberta Wohlstetter's findings on the implications of Pearl Harbor. Thus, warning and response were central topics in the team's basing studies. *Protecting U.S. Power to Strike Back* recommended that coastal bomber bases be moved inland to provide more warning time. While the air force did not do this, it did adopt the recommendations for alert procedures to respond to ambiguous warning and the fail-safe launch of combat-ready bombers. This study also recommended a bomb-alarm system that would reliably tell U.S. commanders where enemy nuclear weapons had fallen, even though normal communications were disrupted. As a young member of Wohlstetter's team, Fred Iklé, who became an under secretary of defense in the 1980s, worked on this system; later he would brief on the need for centrally controlled elec-

tronic locks on nuclear weapons ("permissive action links"). A writer would call him "the Paul Revere of accidental war."⁷

Contributions to Methodology

The RAND researchers were concerned about using proper methodology from the beginning. Edwin Paxson knew that conventional methods would hardly suffice for the analysis of the large and complex sets of variables he was considering in his early bomber studies. Edward Barlow devised ways to aggregate correctly the effects of disparate factors in his air defense studies: bomber attrition due to fighters and anti-aircraft guns, for example; fighter effectiveness as a function of warning-system geography; radar performance at the bomber's altitude; radar networking efficiency; ground observer call-ins; human performance; and fighter maintenance and crew availability.

RAND's Mathematics Division helped the engineers with appropriate ways to put these factors together. Acute, but practical, statisticians helped to convolve several variables that could only be known statistically, and they warned the engineers about going too far with uncertain data. There was also a group working on the newly evolving techniques of game theory. Despite the hopes of RAND analysts, however, game theory could not be used directly in most of the major studies of the 1950s; instead, it led to useful insights and analytic approaches.

Trained as a mathematical logician, Albert Wohlstetter had a rather different approach to systems analysis methodology. Where others had assumed a massive Soviet nuclear attack on cities, factories, and SAC bases, Wohlstetter found how devastating a small attack could be if specifically tailored to avoid early detection and attack the Strategic Air Command itself. He added *a fortiori* proofs to the RAND arsenal of techniques; for example, if radar warning was inadequate against Soviet bombers flying at 1500 feet, clearly it must also be inadequate at the achievable flight altitude of 500 feet. Also, by parsing SAC missions into their component steps and exploring how well each step could be executed when opposed, he uncovered vulnerabilities that had not previously been appreciated. As a result, he derived a general methodology for the analysis of opposed systems. Years later he would say:

The sort of opposed-system design of which I speak studies technologies, operations, political interactions, and economic costs stretching perhaps as much as a decade and a half into the future, and designs alternative systems to operate within that period, which has seemed to be about as far in advance as the technological and political context can be foreseen or parameterized with enough constraints to yield conclusions.⁸

Wohlstetter thus stated succinctly the goals of the RAND researchers for their techniques of inclusiveness and their application of these techniques to practical problems.

Indeed, RAND made important contributions on a practical level to understanding the true costs of military systems. After service as a government economist, David Novick was recruited by Hitch in 1950 to provide the cost information needed for RAND's analyses. Novick soon made the analysts aware of such distinctions as one-time outlays and recurring costs and went on in 1951-1952 to develop the concept of program budgeting, an idea that would have major impact on defense planning in the 1960s.

Spreading the Word About Systems Analysis

The RANDites were keenly aware of the need for good systems analysis methodology. To this end several at RAND joined in the formation of the Operations Research Society of America in 1952, and Hitch, assisted by Marshall and Roland McKean, prepared an invited paper for the first annual meeting of the Society.⁹ Herman Kahn and Marshall also presented a paper on Monte Carlo computations at the same meeting.

Around 1954, RAND's Management Committee asked mathematician Edward Quade, a participant in much of the early work, to put together a course in systems analysis. Fourteen of his colleagues helped, and the course was first presented in 1955 in classified form as "An Appreciation of Systems Analysis for Military Decisions;" the students were military officers and civilians engaged in military work.¹⁰ Among other consequences, the course stimulated the physicist Herman Kahn, a bright and lively man who had prepared one of the lectures, to shift his inquiring mind to methodological problems. After preparing a prospectus for a book on systems analysis and drafts of several chapters, Kahn abandoned the project and turned his attention to the lecture series that became *On Thermonuclear War*, incorporating some of this earlier material into the book.¹¹

Codifying the RAND Strategic View

Since many of RAND's senior people came from scholarly backgrounds, they felt it was important to present their ideas in writing, to seek peer review, and to publish to the extent that security rules permitted. In fact, John Williams wrote a trenchant internal document, titled "How to Peel an Orange," that admonished his colleagues to put their positions into clear written form. Several thoughtful documents

were written in 1953–1954, and RAND's Management Committee established a group chaired by Hitch to meet regularly and discuss the most important strategic questions. At first called the "1960 Committee" and later renamed the "Strategic Objectives Committee," it became an important forum for the discussion of major issues like Williams's ideas on the value of preemptive war or emerging concepts of counterforce attacks. (As the junior member of this committee, I was rapporteur.) By the end of 1954 this group produced broad-ranging guidance for RAND in an internal document called "The Next Ten Years," written by Brodie, Hitch, and Marshall.

After publication of this document, preparation of the systems analysis course, and favorable Department of Defense (DoD) reception of several major studies, including those of Barlow and Wohlstetter, RAND's senior staff had both the self-confidence and the reputation in military circles to spread their ideas to a wider audience.

With several recognized successes in the strategy of strategic airpower, the RAND analysts hoped to make similar contributions to the strategy of tactical airpower. Paxson and physicist Samuel Cohen helped U.S. Air Force, Europe, make the first studies of theater nuclear weapons in 1951–1952. Social scientist Herbert Goldhamer and others consulted for air force officers in Korea in 1951–1952, and a RAND team proposed ways to decrease the vulnerability of theater air forces to attack. Paxson led some imaginative map exercises to explore detailed means for reducing vulnerability. But, beginning in 1956, a series of documents by Norman C. Peterson, a senior aeronautical engineer, and various coauthors may have convinced their colleagues that tactical warfare is too fraught with case-specific relationships to permit the neat generalizations characteristic of strategic nuclear warfare.¹² What the RAND tactical air analysts were essentially calling for was flexibility; this view would affect the military policy of the North Atlantic Treaty Organization (NATO) in the 1960s.

Communicating RAND Views to a Wider Public

The systems analysis course of the mid-1950s, designed to inform RAND's clients about this new methodology, became a barometer of RAND's rising renown. A number of DoD committees on air defense drew heavily on advice from several contributors to this course, including Barlow, other staff members, and me. Herman Kahn turned the lectures that he originally intended for the systems analysis course into a marathon three-day briefing, complete with 50–100 charts. (RAND charts in those days were produced by artists on yard-wide bristol board. Kahn, a two-easel presenter, kept his assistant busy moving

these heavy charts into place.) Kahn further expanded these lectures, which drew heavily on his work in Wohlstetter's projects, and, as previously noted, turned them into a book during a stay at Princeton in 1959.¹³

Wohlstetter himself was invited to participate in several high-level reviews of defense policy by the Eisenhower administration. In particular, he was asked by Rowan Gaither, chairman of RAND's Board of Trustees, to brief a committee on defense preparedness that Gaither chaired during 1957-1958. Wohlstetter's briefing was a key input to the group and a main reason for their urgent call for revamping U.S. strategic forces. Even though Eisenhower declined to spend the substantial funds proposed by the Gaither report, Wohlstetter became acquainted with several high-level administration officials and advisors through the committee. He was invited to give a talk to the Council on Foreign Relations in New York in May 1958, which led Hamilton Fish Armstrong, editor of *Foreign Affairs*, to propose that Wohlstetter write an article that became a classic: "The Delicate Balance of Terror."¹⁴

Wohlstetter was also asked to participate in the Geneva conference on reducing the dangers of surprise attack in 1958. He was appointed deputy chief scientist and formed professional friendships with several analysts from the Atlantic seaboard, among them Harvard economist Thomas Schelling. Schelling spent a sabbatical at RAND the next year working on his *Strategy of Conflict*, which led to the following glowing acknowledgement in its preface:

As a collection of people, RAND is superb. . . . But RAND is more than a collection of people; it is a social organization characterized by intellect, imagination, and good humor.¹⁵

Meanwhile, Charles Hitch was staying home mornings writing a book with Roland McKean to set forth what RAND had learned about the economics of national defense. While its main themes related to efficiency in defense spending, the book also discussed military operations, logistics, and strategy, and included a technical appendix by a prize young member of Hitch's Economics Division, Alain Enthoven.¹⁶ Hitch also included a version of Wohlstetter's "Delicate Balance" as a chapter. (Another young economist, Schelling's student Daniel Ellsberg, was acknowledged in Hitch's preface and recruited into RAND's Economics Division at that time.)

Brodie's years of labor, in which his draft book was critiqued chapter by chapter at RAND, came to fruition in 1959 with the publication of the gracefully written *Strategy in the Missile Age*.¹⁷ And Henry Rowen, after a period at Harvard, produced the first unclassified distillation of

the Wohlstetter team's studies, supplemented by several codifications of strategic issues that proved to be useful to the Kennedy administration.¹⁸

RAND and the McNamara Defense Department

Substantial notice had been taken of RAND's views on the complexities of war in the age of nuclear weapons, and the time was ripe in 1960 and 1961 for some of its leading figures to move into policy-making positions in Washington. The newly named secretary of defense, Robert S. McNamara, had been part of a brainy air corps unit called the Statistical Control Office during World War II, before a meteoric rise to the presidency of Ford Motor Company. His views on management were congenial with RAND's style. After reading Hitch and McKean's book, he invited Hitch to become comptroller in the Department of Defense. Hitch brought in Enthoven, who soon became a highly visible assistant secretary of defense for systems analysis; Hitch's title also was changed to assistant secretary. Rowen became a deputy assistant secretary of defense for international security affairs. William Kaufmann, who had widely briefed a RAND study on counterforce, and Daniel Ellsberg became key consultants, and other RAND analysts took over cost analysis and systems analysis posts. Bruno Augenstein became assistant director of defense research and engineering for intelligence, a job requiring supervision of reconnaissance satellite developments. Fred Hoffman would become a deputy assistant secretary of defense in 1965 and Andrew Marshall, who consulted informally with the Department of Defense in the early 1960s, would move to the National Security Council staff in 1972 and then to a long and influential stand as Director of Net Assessment in the Office of the Secretary of Defense in 1973.

Thus, the RAND methods and views became highly influential in the 1960s. Systems analysis became firmly entrenched as a way of choosing weapons systems. David Novick's cost-analysis techniques were necessary in this method and his work on program budgeting led to the DoD planning, programming, and budgeting system. RAND's counterforce strategy became embedded in McNamara's speeches and policies, many written by Kaufmann, although McNamara would back away when he saw how the air force used the strategy to press for large force increases. NATO, nudged by a RAND team sent by McNamara, would move away from a strategy of automatic nuclear response to flexible response and adopt a form of program budgeting. And the RAND view about U.S. strategic forces remained a high DoD priority: they should be well protected from an increasing Soviet threat so they could survive to strike back.

Deterrence, as elaborated at RAND in the 1950s, has thus been well served through forty years—sometimes by a delicate balance, at other times by a robust ability to retaliate. The early RAND strategists would be pleased if deterrence continues to function until the international system that called it into being changes.

Notes

1. Charles Hitch was head of RAND's Economics Division in 1951.
2. The Wohlstetter team over many years usually included Henry Rowen and Fred Hoffman, both from the Economics Division.
3. This section draws on notes made in July 1988 by Albert Wohlstetter and Fred Hoffman in the course of a bid proposal to the U.S. Department of Defense.
4. Albert Wohlstetter, Fred S. Hoffman, and Henry S. Rowen, *Protecting U.S. Power to Strike Back in the 1950s and 1960s*, RAND Report R-290 (Santa Monica, Calif.: RAND, August 1956).
5. Roberta Wohlstetter, *Pearl Harbor: Warning and Decision* (Stanford, Calif.: Stanford University Press, 1962), p. 1.
6. *Ibid.*, p. 2.
7. Peter Wyden, "The Chances of Accidental War," *Saturday Evening Post*, vol. 234, no. 22 (June 3, 1961), p. 18.
8. Albert Wohlstetter, "Theory and Opposed Systems Design," *Journal of Conflict Resolution*, vol. 12, no. 3 (September 1968), pp. 307-32.
9. Charles J. Hitch, "Suboptimization in Operations Problems," *Journal of the Operations Research Society of America*, vol. 1, no. 3 (May 1953), pp. 87-99.
10. By 1964 many of the papers were declassified; the course served as a basis for Quade to edit a book, *Analysis for Military Decisions* (Chicago: Rand McNally, 1964).
11. Herman Kahn, *On Thermonuclear War* (Princeton: Princeton University Press, 1960).
12. For an example of Peterson's views see his report, *Remarks on Future Wars*, RAND paper P-1085 (Santa Monica, Calif.: RAND, May 1957).
13. Kahn, *On Thermonuclear War*. Albert Wohlstetter, much more careful in his formulations than Kahn, was dismayed by this hastily assembled set of ideas.
14. Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, vol. 37, no. 2 (January 1959), pp. 211-34.
15. Thomas Schelling, *The Strategy of Conflict* (Cambridge: Harvard University Press, 1960), p. vi.
16. Charles J. Hitch and Roland N. McKean, *The Economics of Defense in the Nuclear Age* (Cambridge: Harvard University Press, 1960).
17. Bernard Brodie, *Strategy in the Missile Age* (Princeton: Princeton University Press, 1959).
18. Henry S. Rowen, *National Security and the American Economy in the 1960s*, Study Paper No. 18, Joint Economic Committee Print, 86th Cong., 2nd sess., January 30, 1960.

3

The Development of U.S. Nuclear Strategy and Employment Policy

Henry S. Rowen and Richard Brody

Should a President in the event of a nuclear attack be left with the single option of ordering the mass destruction of enemy civilians, in the face of the certainty that it would be followed by the mass slaughter of Americans?

—U.S. Foreign Policy for the 1970s,

A Report to Congress by Richard M. Nixon, February 18, 1970

Obviously a rhetorical question, President Nixon's query in his first foreign policy report posed sharply the issue of nuclear options in response to a nuclear strike on the United States or its allies. It was not until January 1974 that there was an official answer, which was: No, the president should have more than a single option. At that time Secretary of Defense James Schlesinger announced the United States was changing its nuclear plans to provide for a greater range of options, including ones that would be substantially less massive than those that had been available in the past.

Many observers in 1974 were surprised by the revelation that the United States had little flexibility in its nuclear plans. More than a decade had passed since Eisenhower's strategy of massive nuclear retaliation had been abandoned. In 1961, President Kennedy had adopted a policy of having a wide range of military choices. Evidently, however, this decision had limited effect on nuclear planning. This chapter traces the history of these and other influences on U.S. nuclear

The opening sections of this chapter are adapted from Henry S. Rowen, "Formulating Strategic Doctrine," Part 3 of Appendix K of the report of the Commission on the Organization of the Government for the Conduct of Foreign Policy (The Murphy Commission), June 1975. Richard Brody assisted with the later sections of the chapter.

planning over the three decades that led to Nixon's complaint about his lack of nuclear options and the decade and a half after, during which the United States continued to struggle with this problem.

The issue of nuclear strategy is not only of historical interest; it remains a matter of considerable policy relevance. The role of nuclear weapons in the more promising, but still highly uncertain, future that we now face is far from settled. If anything, nuclear strategy in the future may be more complex and difficult than in the past. Anyone who doubts this should reflect on the problem of the role of U.S. nuclear weapons in a world in which many countries, perhaps not all politically stable, possess them.

World War II Experience

The beginning of understanding of later developments is an appreciation of the significance of the strategic bombing experience of both the British and the Americans in World War II. Although the Royal Air Force (RAF) did not enter World War II with an area-bombing doctrine, it soon adopted one. Britain's employment of bombing against urban areas was in substantial measure the unintended product of its poor bombing accuracy. Poor accuracy contributed to civilian casualties in two ways: first, even when strictly military objectives were pursued, a large number of bombs would miss the targets and fall almost at random. In the early part of the war only about one-fifth of the bombs dropped by the RAF fell within five miles of their targets. Second, this known inaccuracy led to the deliberate selection of targets in the middle of built-up areas so that the large number of misses would do some "good." It was also argued that bombs falling at random on German towns would smash German morale, making a virtue out of necessity. Further, these indiscriminate raids, carried out in the heat of war, were a response to the German raids against British cities; they were also the product of British frustration in having no other way to strike directly at Germany until the invasion in 1944. Their continuation was probably dependent on the fact that the Germans could not reply in kind.

The American strategic bombers of the Eighth Air Force, using optical means to bomb by day and in good weather, were able to achieve much greater accuracies than the British bombing by night. The Americans attempted to pursue a policy of precision strikes against selected targets, but this policy deteriorated during the course of the war. German air defenses made clear-weather attacks costly, intelligence limitations kept some targets from being correctly identified, and a desire to cooperate with the RAF led to strikes on targets that were

really surrogates for area attacks on towns (e.g., the marshaling yards in Dresden). In the bombing campaign against Japan, the tactics of the Twentieth Air Force shifted when General LeMay replaced General Hansell. U.S. area attacks—for example, the fire raids on Tokyo—then became a matter of policy.

The upshot was that by the end of World War II “strategic” bombing—the bombing of the war potential of an adversary—had come to be associated with large-scale civilian destruction, at least as a by-product.

Early Nuclear Doctrine: Continuity with World War II

The policy of strategic bombing was disputed during the war on several grounds: the relative payoff from allocating resources to long-range bombers versus other military forces; the efficacy of area attacks versus those against specific war-related factories; and the morality of area-bombing attacks. Later analysis intensified doubts about the policy of strategic bombing.

Nevertheless, as American concern with the Soviet threat to Western Europe grew in the late 1940s and early 1950s, a strategic bombing capability came to be viewed as an essential means of coping with that threat. The belief that the Soviet Union had superior conventional strength in Europe and elsewhere around its borders, along with the knowledge that we had clear nuclear superiority, dominated U.S. defense policy for many years. Reliance on the weapon that gave us a clear advantage in countering Soviet strength on the ground seemed obvious. The ability to deliver, say, 100 weapons with yields in the tens of kilotons on Soviet areas that contained the majority of their steel, petroleum refining, aircraft, and munitions industries was thought to be an impressive deterrent. If the Soviets were to attack nonetheless, the carrying out of such an attack promised an important advantage, assuming there was enough strength on the ground to keep the Soviets from quickly taking over Western Europe. In short, the nuclear planning task was seen as an extension of strategic bombing in World War II, but greatly compressed in time, magnified in effect, and reduced in costs. The principal U.S. targeting objective was destruction of critical war-supporting industries in order to affect Soviet battlefield operations, the longer-term ability of their economy to support combat, and their will to continue the war. The designated ground zeros were almost entirely (1) industrial facilities; (2) “retardation” targets, e.g., transportation links whose destruction was intended to slow the westward movement of Soviet forces; and (3) counterforce targets, the bases of the small and concentrated Soviet long-range air force. Population

damage in this period was viewed largely as a by-product of attacks on industrial and retardation targets.

In the early 1950s the Soviet long-range air force was regarded neither as a major target system nor as a threat to the survival of our own air forces. Here, too, there was an element of continuity with the past: enemy attack on our bases had not been much of a problem throughout most of World War II. Work done at the RAND Corporation by Albert Wohlstetter and others in the early 1950s showed, however, that even a small Soviet long-range air force had the capacity to destroy U.S. strategic bases overseas—on which we were then dependent—and even threatened forces in the United States. Although these vulnerabilities were correctable, the work of the Wohlstetter team focused attention on what was to be a continuing concern in U.S. defense planning, the possibility of the Soviets developing a nuclear strike capability to destroy our strategic offensive forces. This possibility had implications not only for the survival of our own forces, but more broadly for the stability of the strategic balance. Vulnerable nuclear forces on both sides would provide an incentive for each to strike first in an ambiguous situation. Albert Wohlstetter was the first to call attention to this phenomenon in "The Delicate Balance of Terror," published in 1959.¹ These concerns led to many actions to reduce the vulnerability of our strategic forces in the 1950s and the years since then.

A different response to the developing Soviet long-range nuclear threat was a proposal, urged by scientists at the Massachusetts Institute of Technology and elsewhere, to build a U.S. continental air defense system. This idea was developed in the Lincoln Laboratory summer study of 1952, which proposed construction of a large and costly air defense control system for the United States. This air defense system was designed primarily to achieve high effectiveness in defending U.S. cities against nuclear attack by Soviet bombers. Since only a small number of bombs had to get through in order to do great damage to these cities, the task faced by this system was formidable. In fact, it later proved to be infeasible. But as late as the Gaither Committee report in 1957, even after the development of high-yield fusion weapons and with intercontinental and sea-based missiles in the offing, the advocates of defense proposed a costly program of air defenses, antimissile defenses, and civil defenses to protect U.S. industry and population from attack. The report also advocated improved protection for our strategic forces along the lines that had been proposed by Wohlstetter. It is not irrelevant to the matter of flexible nuclear options to observe that many of the enthusiasts for protecting the U.S. population from attack in the 1950s were to shift in the 1960s to the position

that populations were the *only* appropriate target for attack in a nuclear war.

The alternative of using nuclear weapons only or mainly on the battlefield did not seem feasible in the immediate postwar years. Individual battlefield targets did not present large concentrations of military value and they were too numerous to warrant expenditure of the small stockpile of nuclear weapons on them. The possibility of having weapons for battlefield use, or indeed of limiting their use in this way, was, however, of interest to the U.S. Army and to some scientists. Project Vista, conducted at the California Institute of Technology in 1951, was an early effort to develop this concept.

In sum, in the period before the H-bomb was developed in the early 1950s, U.S. doctrine on the bombing of cities was ambiguous. The use of fission weapons delivered by medium and heavy bombers against the Soviet Union was part of the strategy for the defense of Western Europe. Many of the targets were selected with the intention that they would have an effect, immediate or delayed, on the ability of the Soviets to carry on a war; threatening these targets was also to serve as a deterrent to Soviet attacks. Nuclear strikes on targets located in population centers would have caused a good deal of population damage, but the number of weapons and their yields were still small enough that there was a large difference in the civil damage that would have been produced then and what was to be possible only a few years later.

The possibility of building the H-bomb produced an intense debate on the uses of nuclear weapons. Many of the opponents saw it as a weapon that could be used only against cities and did not think it was needed for that task; fission weapons in larger numbers were good enough. Others opposed attacking cities and favored having a large number of lower-yield fission weapons for use against military targets. The H-bomb proponents did not argue that they wanted to make it easier to destroy cities; they were mainly interested in a more powerful and efficient weapons technology. Ironically, all sides assumed that these weapons would be usable mainly against cities, and big cities at that; they missed the main impact that thermonuclear weapons were to have for at least the next quarter century: to permit development of lightweight, medium- and lower-yield nuclear weapons.

The development of thermonuclear weapons by both the United States and the Soviet Union did, however, have consequences for the civil damage that a nuclear war would cause. Although the number of vehicles in the U.S. strategic force did not change greatly between 1954 and 1960, the total megatonnage in our strategic offensive and defensive forces increased over twentyfold. (The peak in megatonnage—

and in "effective megatonnage," another index of damage—was in 1960.) With yields in the megatons instead of kilotons, the delivery of only a few hundred weapons could destroy a large part of the industrial capacity and, absent extensive civil defenses, a major part of the populations of even the largest countries.

The discovery that these weapons could not only be made large in yield but light in weight, i.e., that they would have a high yield per pound and could come in small as well as big packages, made long-range ballistic missiles practical for both land basing and submarine basing. It also meant that our strategic bomber force, which was concentrated on a small number of air bases in the United States and therefore already vulnerable to a coordinated "sneak" attack by Soviet bombers, would soon become highly vulnerable to an attack with ballistic missiles.

One consequence of the recognition of this new threat was further changes to reduce the vulnerability of our strategic nuclear posture throughout the 1950s and 1960s. Another was reinforcement of the notion that a U.S. nuclear strike had to be quick and massive rather than controlled and discriminate, because strategic bases and forces could not be expected to survive long in a conflict. Still another was that, as the Soviet nuclear force grew, it became an important target system. And because the Soviets were slow in reducing the vulnerability of their nuclear forces, it was feasible for us to assign weapons to nuclear threat targets with high damage expectations, assuming that a large portion of the Soviet forces had not been launched by the time our weapons arrived on target—a not unreasonable supposition for some contingencies, given their normal low readiness state.

By the late 1950s the long-range delivery forces of the United States consisted of over 2,000 vehicles, with some vehicles carrying more than one bomb: about 500 B-52 long-range bombers and 1,500 B-47 and RB-47 medium-range bombers and reconnaissance aircraft, plus some B-58 bombers and a variety of Snark, Thor, Jupiter, Mace, Matador, and Regulus missiles. This force could cover many more targets than in the late 1940s and early 1950s, when the United States had only a few atomic bombs. Moreover, the large area of destruction that would be produced by the megaton-yield weapons that became operational in the mid- and late-1950s meant that attacks on military or industrial targets in or on the edge of cities inevitably would produce a great deal of damage to populations. With thermonuclear weapons, only a few bombs needed to be delivered to destroy each target, but their effects were widespread and destructive.

The idea that cities were the natural targets for thermonuclear weapons was reinforced by the low accuracy expected of ballistic

missiles at that time. U.S. estimates in the mid-1950s were that these missiles would have average miss distances of three to five miles. The large area of damage produced by high-yield weapons could more than compensate for such large inaccuracies when attacking cities. Inaccurate ballistic missiles would also be effective against soft strategic forces such as aircraft on air bases and above-ground, fixed missile sites. But the vulnerability of strategic forces could be reduced by putting missiles under the sea or underground in hardened silos and flying alert bombers off their bases on warning. Cities, on the other hand, could not be moved.

The major command responsible for conducting strategic nuclear operations was the Strategic Air Command (SAC), the descendant of the Eighth and Twentieth Air Forces that had carried out the U.S. bombing campaigns against Germany and Japan. Its wartime experiences were bound to have an important influence on its doctrine.² Shaped by this World War II experience and the views of its longtime commander, General LeMay, the Strategic Air Command became committed to a high standard of operational proficiency, a high state of readiness, and the concept of delivering a crushing blow simultaneously against all sources of the opponent's strength: military forces, industrial facilities, and governmental controls. The SAC view of strategic bombing was that the threat of a large-scale U.S. nuclear response could deter the Soviets from engaging in virtually the entire relevant range of hostile acts; the side that prevailed militarily would dominate the postwar period; Soviet military forces were, therefore, important targets; and urban-industrial facilities and government controls should be hit because their destruction would cripple the Soviet ability to wage war and the ability of their regime to maintain internal control.

The SAC doctrine was clearly consistent with the overall defense policy of the Eisenhower administration. The principal threats to U.S. security were seen as the danger of nuclear war and the danger of excessive military spending forced by competition with the Soviet Union. Having a strong nuclear posture was viewed as a way to cope effectively and economically with these dangers. It also was consistent with the massive retaliation doctrine enunciated by Secretary of State Dulles, although this doctrine was not regarded by him as an alternative to having more flexible means for dealing with small contingencies. The Eisenhower administration had adopted a policy of primary, but not sole, reliance on nuclear weapons. Given the available technology and prevailing operational concepts, this policy was one in effect of planning to inflict massive civil damage.

Emergence of Alternative Doctrines in the Late 1950s

The belief that thermonuclear weapons meant that nuclear war would involve massive and indiscriminate damage to civil societies was widely shared by the end of the 1950s. The extreme version of this view was the proposal by some scientists and naval officers that cities should be the *only* nuclear targets. Although earlier, in 1948, the navy had attacked the air force's B-36 long-range bomber program in part on the grounds that it was designed for the mission of delivering nuclear weapons on cities, the invention of the Polaris submarine missile system resulted in a shift of views. Many of the scientists who had opposed the buildup of strategic forces, who had fought the development of the H-bomb, and who had favored strong air defenses for the United States reversed field. The threat to attack cities went from being bad to being good. It was argued that submarine-launched ballistic missiles (SLBMs) could be aimed at cities and launched in a deliberate and controlled way.

One variant of this view was that the strategic force need only consist of a small (called a "finite") number of Polaris missiles, in contrast to having strategic vehicles for use against both Soviet military forces and urban-industrial targets. On this view, aiming at such targets as long-range bomber bases and missile sites was especially bad because it meant threatening a force vital to the Soviet Union. This, it was argued, would cause the Soviets to expand their strategic force, which in turn would threaten us and drive up the size and cost of our strategic forces, *ad infinitum*. The result would be an "uncontrollable" arms race as the two sides reacted to each other, all at progressively higher levels of forces and budgets.³ Moreover, the concealment, mobility, and therefore likely high degree of survivability of the Polaris force meant that it did not present targets to the Soviets that would stimulate them to increase their strategic forces and expenditures.⁴ The funds saved by adopting this strategy could then be spent on conventional—and what were held to be more relevant—forces such as aircraft carriers.

A very different doctrine was developed during the 1950s at RAND and by some air force officers. The context of this work was the need for assuring a protected power to retaliate. Within this context, some of the work emphasized controlled response, but not against cities. This view held that planning for nuclear strikes which had a spasm character, especially against cities, was irrational, unnecessary, and indeed suicidal. Instead, attacks on urban targets should be withheld in large strikes; any such attacks, if carried out at all—which seemed

to many analysts highly undesirable—should be conducted in a deliberate and controlled way. This view stressed the importance of the military outcome in a nuclear war, both in terms of the ability to erode Soviet military strength and to limit its capacity to do damage to the United States.

The U.S. Army's view of nuclear weapons was ambivalent. It naturally wanted to make use of these modern weapons and, as low-yield, lightweight weapons became technically feasible, a considerable variety of short-range nuclear weapons were developed and bought. (And some not of short range; the army's Jupiter ballistic missile had a nominal range of 1500 miles.) The army explored many ways in which nuclear weapons might be used on the battlefield, either in conjunction with an all-out nuclear campaign or as an alternative to it. The results were not encouraging. The tactical problems of maneuver, communications, and command on the nuclear battlefield appeared formidable, not to mention the difficulties of keeping troops motivated in a nuclear engagement and of limiting collateral damage to civilians in the combat area. Moreover, there was no assurance that the Soviets would play the preferred game of limiting nuclear weapons to low yields. They might, for example, decide to try to blast through the Seventh Army in Germany with high-yield weapons. The army was divided on this matter, but on balance concluded that nonnuclear capabilities should receive most emphasis. Nevertheless, the army acquired a large number of nuclear weapons, partly because the Eisenhower administration had adopted a policy of placing primary reliance on nuclear capabilities and partly as a hedge against the possibility that battlefield nuclear use might actually occur.⁵

Despite discussion of these alternatives, U.S. nuclear strategy in the late 1950s was dominated by the concept of the "Optimum Mix," the planned massive response by the Strategic Air Command to a Soviet attack abroad or against the United States. This strategy provided for U.S. nuclear strikes on a combination of military, industrial, and government control targets. It was incorporated into the strategy of the North Atlantic Treaty Organization (NATO) in Military Committee document 14/2 (MC 14/2), which called for a nuclear response to any Soviet intrusion, even local, if it persevered.⁶ This strategy prevailed to the end of the Eisenhower administration despite increasing evidence, displayed vividly in Sputnik and tests of intercontinental ballistic missiles (ICBMs), that the Soviets were building a strong capacity to attack the United States. It persisted in the face of growing doubts within the administration about the wisdom of continuing Eisenhower's basic national security policy of placing primary reliance on nuclear weapons.⁷

Expansion of Options in the Early 1960s

The Kennedy administration made reduced dependence on nuclear threats its major defense policy initiative. This shift was undertaken on two grounds: (1) strengthening deterrence by having more credible means of response to the more probable (i.e., smaller and nonnuclear) kinds of contingencies that were anticipated; and (2) having an alternative between suicide and surrender if deterrence failed. This meant more emphasis on nonnuclear forces. Moreover, deeper investigation into Soviet conventional strength led to a reevaluation of the conventional force balance between the Soviet Union and NATO; the result was a considerable deflation of the Soviet side. Instead of seeming hopelessly impossible, the task of providing a strong nonnuclear defense of Europe came to appear attainable to many U.S. planners, but by no means to all—and certainly not to all Europeans. To be sure, there were important NATO weaknesses, such as inadequate stocks of ammunition, which if not remedied could be fatal, but the prospect for an effective nonnuclear defense in many contingencies seemed far from hopeless. There were, however, still uncertainties and some contingencies almost certainly could not be met at the nonnuclear level. Therefore, deterring nonnuclear attack in some areas and deterring Soviet first use of nuclear weapons in all important areas still required a U.S. nuclear threat.

The upshot was no reduction in U.S. nuclear weapons abroad. On the contrary, the number in Europe increased substantially during the 1960s for several reasons. The policy inherited by the Kennedy administration was one of adding to theater nuclear stockpiles and a major effort would have been needed to reverse it. Further, the policy of defending Europe with nonnuclear forces could not be carried out by the United States alone. European cooperation was necessary, and the Europeans were suspicious of U.S. motives in emphasizing nonnuclear forces. Perhaps more importantly, they were unwilling to spend the money needed to upgrade their conventional forces. Faced with European suspicions about its intentions and eager to win support for a buildup of conventional forces, the administration was unwilling to lend support to those on both sides of the Atlantic who charged that this policy was really one of reducing the U.S. commitment to Europe (what later came to be called a "decoupling" of the United States from Europe). A change in policy that reduced or reversed the flow of U.S. nuclear weapons to Europe would have been held by some to signal a dangerous erosion of that commitment. Finally, although the Joint Chiefs of Staff (JCS) did not have a sound basis for proposing the continued buildup of nuclear weapons in Europe, Secretary of

Defense McNamara was not armed with powerful arguments to oppose it.⁸ He went along with increases in theater nuclear weapons because he did not think they made much of a difference one way or another and saw no good grounds for making trouble with the Joint Chiefs of Staff and the Europeans on this issue.

The other key defense initiative taken by the Kennedy administration was the strengthening of our protected second-strike capacity. Both the Polaris SLBM and the Minuteman ICBM programs were speeded up and the alert level of U.S. strategic bombers was increased. These decisions were motivated by concern for the vulnerability of our strategic force, not by targeting considerations. They were accompanied by the retirement of the rest of the B-47 force, the phasing out of the Snark, Mace, Matador, Thor, Jupiter, and Regulus missiles, the stopping of B-52 and B-58 production, and the cancelling of the B-70, Skybolt, and nuclear-powered airplane development programs. There were also large cuts in air defenses. As a result, the budget for strategic offensive and defensive forces contracted, both in constant and current dollars, during the rest of the 1960s and into the 1970s. Nevertheless, the programs that were funded provided a large strategic nuclear force that would be secure for some time into the future against advances in Soviet offensive forces. The combined effect of these changes was to reduce dependence of our strategic forces on warning and quick response for survival. The B-52s still depended on warning and being on high alert for their survival, but the sheltered Minutemen and especially the Polaris missiles at sea did not. These changes helped to provide a technological basis for a strategy that sought to avoid dependence on a massive nuclear response.

Secretary of Defense McNamara saw the importance of having an ability to respond to an attack deliberately and selectively. For one thing, there was the possibility of a Soviet nuclear strike limited to our strategic forces; or the possibility of Soviet limited nuclear use against U.S. or allied troops in Europe or elsewhere; or the contingency of a large-scale Soviet conventional attack in Europe, for which we had continually and from the very start said we would use nuclear weapons if nonnuclear means were insufficient. The point was not that contingencies of this sort seemed likely, but that if they were to occur and the United States had only the choice of a massive nuclear response or doing nothing, the results would be catastrophic.⁹

Consistent with this view, a change in nuclear planning was made in the early 1960s. Basic U.S. options were developed that differentiated more clearly between attacks directed against military targets and those against cities. Although this meant a shift away from the earlier Optimum Mix, which was essentially a single-option approach, the new

attack options still used thousands of weapons, as Secretary of Defense Schlesinger pointed out later. The principal objective remained deterring Soviet attacks on allies and the United States by the threat to carry out large-scale nuclear operations, including attack of urban-industrial targets. A second objective was to attempt to limit damage directly in the event deterrence failed by attacking Soviet nuclear forces, by active defenses, and by civil defenses (the last was difficult to sell to Congress). The indirect, and potentially much more powerful, way to limit damage was to increase the adversary's incentive to limit damage to us by withholding U.S. attack on his cities. This concept was basic to the option that withheld urban attacks.

Despite his continued endorsement of the importance of controlled response as long as he was in office, McNamara's statements on nuclear forces and doctrine shifted emphasis after 1963 to the concept of assured destruction. This doctrine held that a nuclear exchange would with high probability result in over 100 million deaths in both the United States and the USSR and that attempts to limit damage through active and passive defenses could readily be defeated by the adversary's improvements in offensive forces. The principal test of adequacy of the U.S. strategic force came to be the ability of our programmed force to produce civil damage, even against a greater-than-expected threat. The damage criterion settled on by McNamara for determining the size of the strategic force was the destruction of 20-25 percent of the Soviet population and 50 percent of its industrial capacity.

The programmed forces decided on in the early 1960s readily met this test, so readily that it seemed evident that our forces were more than adequate. The primary purpose of the doctrine of assured destruction capabilities was to provide a metric for deciding how much force was enough. It served as a basis for denying service and congressional claims for more money for strategic forces. It also dramatized for the Congress and the public the awful consequences of large-scale nuclear war and its inappropriateness as an instrument of policy. Assured destruction was never, however, proposed by McNamara or his staff as a way of actually using nuclear weapons.

Assured destruction was symmetrical. It implied that limiting damage to the U.S. population against large direct nuclear attack was infeasible or too costly. Nevertheless, direct damage limiting continued to be advanced by some as an objective for strategic offensive and defensive forces. But analyses in the 1960s of the cost of protecting populations versus the cost of destroying them showed the defense to be at a serious cost disadvantage. This unfavorable cost ratio and the high cost of such a defense, perhaps along with the political obstacles encountered in trying to persuade the Congress to support a nationwide

fallout shelter program, led McNamara and President Johnson to conclude that damage limiting on a large scale should not be pursued. In a special message to the Congress in February 1965 Johnson said that we should be alert to the possibility of limiting destruction to ourselves, but that a comprehensive damage-limiting program would be costly and uncertain in effectiveness. He also said that defense spending would be a declining proportion of a growing gross national product (GNP), with the resources thus freed up going to meet other needs.¹⁰

There were serious problems with the doctrine of assured destruction. For one thing, the United States continued to affirm its intention to use nuclear weapons for the defense of Europe, if needed. But many Europeans and Americans continued to believe that Europe, or important parts of it, could not be reliably defended at the nonnuclear level. And it was becoming decreasingly credible that we would commit suicide in the event of an attack on Europe. Would the Soviet Union be deterred if our only capability for a nuclear response to an attack abroad was a suicidal one?

To be sure, McNamara continued to mention, albeit in passing, the case for flexible nuclear response and the objective of limiting damage, but the United States had visibly cut back on air defenses and civil defenses and had no plans for antiballistic missile (ABM) defense of population. Increasingly, what was being communicated to the American people, the Europeans, and the Soviets was the prospect of 100 million dead Americans, a similar number of dead in the USSR, and a large number of dead Europeans if a nuclear exchange were to occur. McNamara sought to resolve the conflict between the assured destruction doctrine and our commitments to allies by trying to persuade the NATO allies to have enough nonnuclear strength that they were not dependent on the threat of first use of nuclear weapons. Although his arguments were substantively powerful, the Europeans did not regard them as highly persuasive and, in any case, McNamara's arguments left unsolved the problem of what to do if the Soviets used nuclear weapons first. Any nuclear use by the Soviets, or the Chinese for that matter, that left us with a stake in the continuance of our society faced us with the need for having both a policy and a capability for non-suicidal responses.

Flexible Nuclear Options

President Nixon's strategic doctrine, labelled "Strategic Sufficiency," was put forward in several annual "State of the World" reports issued by the White House. It meant having strategic forces strong enough

to deter strategic attacks on us and our allies and strong enough to face an aggressor contemplating less than all-out attack with an unacceptable risk of escalation; it also meant having forces strong enough to keep U.S. allies from being coerced. This doctrine contained themes that had been put forward by McNamara earlier: indiscriminate mass destruction of civilians should not be our sole response to attacks; the ability to use force in a controlled way helps deterrence; if war comes, we need some way to try to prevent escalation; and there should be no policy of launching missiles on warning of attack. But nowhere in his public statements did President Nixon state that actions had been taken to implement his position. He was hardly able to do so because the Joint Chiefs of Staff were given no directives to develop flexible options until 1974. Such flexibility as there was, which consisted mostly of some contingency plans outside of the SIOP, had been prepared on the initiative of the Joint Chiefs of Staff and the major operational commanders.

Strategic sufficiency, as elaborated by Nixon's secretary of defense, Melvin Laird, centered on four objectives: (1) having a second-strike capability adequate to deter an all-out surprise nuclear attack on our forces; (2) providing no incentive to the Soviet Union to strike first in a crisis; (3) preventing the Soviet Union from having a greater ability to do urban-industrial damage to the United States than we could do to it; and (4) being able to defend against small nuclear attacks or accidental launches. Strategic sufficiency also included having forces adequate to prevent allies, as well as the United States, from being coerced by having strategic nuclear forces that could buttress U.S. and allied theater nuclear forces and by having alternatives to mass destruction responses against urban and industrial targets. Laird's version of the doctrine repeated familiar themes: the importance of a second-strike capacity, reducing first-strike incentives, protection against small attacks, the need for flexible options, and the contribution of strategic forces to defense of allies. It also echoed the theme of assured destruction (while explicitly rejecting it) in stating the objective of being able to do more civil damage to the Soviet Union than it could do to us. On balance, while there was a tilt toward a policy of flexibility and discrimination, it was hardly a marked shift.

Secretary Schlesinger's arguments for flexible options were similar to those used by McNamara; the differences largely reflected changes in the military balance between the 1960s and the 1970s. He stated two purposes: to enhance the credibility of deterrence and to help keep conflict at a low level if it were to occur. In contrast to the early 1960s, however, the objectives of limiting damage to the United States by having the capacity to deny the Soviets the ability to kill U.S.

civilians was rejected. Schlesinger emphasized that the United States could not achieve the capability to destroy the Soviet strategic force, not least because the Soviet force had a large, untargetable submarine component. He also argued that a policy of flexible options did not require any change in our force structure.¹¹

The development of nuclear options under Schlesinger emphasized contingencies of special concern to our allies, such as major attacks on Western Europe, and an improved U.S. and allied ability to respond to such attacks in a nonsuicidal way. As in the 1960s, strong nonnuclear capabilities were essential, but smaller nuclear options were also needed for deterrence and defense. As an example of a class of targets whose destruction might assist the defense of Europe Schlesinger mentioned the Soviet oil refining industry, whose output arguably was essential for a successful Soviet attack. Having the ability to destroy targets such as refineries while preserving nontargets such as people requires attack precision. In fact, improvements in accuracy were permitting marked reductions in warhead yields, so that such attacks were becoming feasible (the change from early ballistic missile accuracies was striking).

Another contingency mentioned by Schlesinger was the possibility of a Soviet attack limited to U.S. ICBMs and SAC bomber bases; if the Soviets chose to limit collateral damage, the resulting U.S. fatalities could be held to a small fraction of the deaths that would be produced by a direct attack on U.S. cities. In short, discriminate attacks were becoming increasingly feasible.¹² This did not mean that such contingencies were at all likely or that discriminate nuclear capabilities necessarily would be used. On the contrary, these were seen as remote possibilities. But these capabilities, it was held, improved deterrence, keeping such possibilities remote, and could make a major difference in war outcomes in the event deterrence failed.

Schlesinger mentioned several obstacles to implementation of a policy of limited options, including command and control, limitations in existing weapon systems, and the "mental approach" of the planners. On this last obstacle, significant changes in operational techniques apparently were needed to develop the kinds of options desired; the variety of constraints implied by the new doctrine evidently presented difficulties for planners and operational commands. Moreover, it was difficult to think through and to anticipate specific contingencies in which small nuclear options might be used. (It was, of course, very much harder to think of realistic contingencies in which the massive use of nuclear weapons would take place.) On the other hand, detailed planning of nuclear options in the midst of an actual contingency was not likely to be done well. Much might be done in advance to develop materials and techniques applicable to a wide range of situations.

Without this preparation, the alternatives available in the crisis were likely to be a poorly executed attempt to be selective, too massive a use of force, or—most likely—governmental paralysis.

Soviet Movement Toward the Capability for Selective Nuclear Strikes

President Carter, like many presidents, came into office having little experience with nuclear policy issues. In any case he soon became interested in deep cuts in strategic nuclear forces and implicitly endorsed minimal deterrence:

Prior to the inaugural, the President-elect had met for broad strategic briefings with the Joint Chiefs of Staff on more than one occasion, and had startled them by asking whether they felt that American security and the strategic balance could be maintained if both the Soviet Union and the United States were to reduce their arsenals to 200 ICBMs each. It was unclear to me whether the JCS were more astonished by this notion or more tempted to exploit it to avoid any progress on arms control altogether.¹³

Carter's interest was reflected in his initial strategic arms control proposal to the Soviets in early 1977. Cuts were proposed to about 20–30 percent of the levels outlined in the Ford administration's arms control discussions at Vladivostok.

The Soviets rejected this proposal for deep cuts and continued to modernize their strategic nuclear forces after concluding the SALT I agreement. Through the early 1970s, the United States had been confident that its nuclear forces were adequate. The principal tests of the adequacy of our strategic forces were their survivability and our ability to use them to counter Soviet advantages at the theater level, particularly those for a large conventional attack in Europe. The perceived problem of NATO conventional inferiority did not diminish in the Carter period; indeed, it was compounded by continued Soviet improvement of their conventional forces and their deployment of improved theater nuclear forces, most notably the SS-20 intermediate-range missile. Moreover, Soviet strategic force improvements threatened the survivability of U.S. strategic forces. The assumption that U.S. strategic forces could offset Soviet theater superiority came into direct question in ways that it had not been since the early 1960s.¹⁴

Concerns about Soviet strategic nuclear improvements changed the American perspective on nuclear employment policy at two different levels. First, there was increased worry that the Soviets were developing

capabilities for selective nuclear attacks, including a counterforce strike on our ICBMs. In the Carter administration even policy makers such as Secretary of Defense Brown, who did not put much weight on the possibility of exploiting our potential advantage for a selective nuclear campaign, felt the need to develop parallel U.S. options for selective nuclear strikes as a counter to any possible Soviet belief that *they* would have an advantage in such a campaign.¹⁵ Second, the improvements on the Soviet side suggested the need for tighter integration between U.S. force acquisition and employment policy than before. During the Carter administration, particularly in the Presidential Directive 59 (PD-59) study, these were explicitly joined.¹⁶

The interaction between employment policy and force acquisition was highlighted in the debate over the "window of vulnerability": whether or not there was an urgent need to replace the Minuteman ICBM force with more survivable and capable missiles. A key issue was whether or not a selective Soviet attack on our ICBMs was a real threat and the adequacy and appropriateness of a "launch-on-warning" policy as a response to Soviet attacks.¹⁷ A launch-on-warning policy would not, of course, fit well with a policy of controlled nuclear responses since the decision about the U.S. response would have to be made before there was information to assess the nature of the attack that prompted it. Despite the consensus that developed on the desirability in principle of a more survivable ICBM, a variety of military, technical, and political problems prevented agreement on a successor to Minuteman. This disagreement lasted well into the Reagan administration, by which time the employment policy motivations of the MX decision were largely overtaken by events and the ICBM modernization debate focused on narrower acquisition issues.

Of more lasting significance for the interaction between strategic forces and their employment policy were the efforts of the Carter administration to provide enduring command, control, communications, and intelligence (C³I) to support flexible employment in an extended conflict. In parallel with their continued large nuclear force investments after the SALT agreements, the Soviets renewed their efforts to increase the survivability of their leadership in a nuclear war.¹⁸ This Soviet move in the direction of a nuclear warfighting capability caused considerable concern in the Carter administration because it could not be explained away, like the Soviet ICBM MIRV and accuracy improvement programs, as an attempt to gain parity with the United States.¹⁹

In 1980, a series of presidential directives were issued concerning our strategic posture:

The new directives were concerned with mobilization, defense, command, and control for a long conflict, and with flexible use of our forces,

strategic and general-purpose, on behalf of war aims that we would select as we engaged in conflict. All of that . . . designed in keeping with both the capabilities and the doctrines of our potential opponent and thus more likely to deter him effectively.²⁰

Particular attention was given in this period to the creation of a preplanned menu of options for nuclear strikes, each designed to accomplish a specific purpose (for example, destroying Soviet military forces opposite China) while being clearly limited in effect, including minimizing collateral damage. The existence of such building blocks, which were to be selected by decision makers in wartime, would allow a good deal of flexibility, at least against fixed targets, despite the limits on then-available capabilities to create totally new nuclear strike plans in the midst of a war.²¹

The evolution of nuclear weapons employment policy during the Reagan period involved extending and giving reality to concepts articulated at the end of the Carter administration. In particular, major improvements were made to C³I endurance and hence the ability to conduct an extended selective nuclear campaign.²²

Meanwhile, the issue of a new ICBM, while not resolved, faded in urgency. A presidential commission chaired by General Brent Scowcroft concluded that, at least in the near term, ICBMs in silos contributed to the survivability of the Triad of strategic forces, even if they might be vulnerable to attack as an individual element of that Triad.²³ The commission highlighted the dilemma the Soviets would face in designing an attack to destroy both our bombers and our silo-based ICBMs, and argued that, while either element was vulnerable to an attack optimized against it, those optimized attacks could not be executed simultaneously. Although the commission's reasoning was not universally accepted,²⁴ it effectively ended the public debate about the window of vulnerability. Meanwhile, deployment of the Trident D-5 SLBM near the end of the Reagan administration offered an alternative prompt hard-target kill capability to that of U.S. ICBMs, further reducing concerns about ICBM vulnerability.²⁵

During this period Soviet deployment of mobile ICBMs created a new problem for targeting doctrine—or so it appeared. (In reality, the Soviets had long possessed mobile missiles able to reach the United States—in submarines.) There had existed a division between those who favored developing flexible options to support theater operations in an ongoing campaign (which suggested sequential strikes) and those who favored focusing our strategic nuclear forces against Soviet strategic (i.e., long-range) nuclear ones, especially the large Soviet ICBM force based in silos (which suggested a single large attack). Soviet fielding

of mobile ICBMs forced a convergence of these two schools, as U.S. nuclear weapons employment planners faced the problem of attacking movable forces, a problem that required sequential strikes because of the difficulty of locating dispersed mobile missiles. Among other things, planning for attack of these units required enduring target acquisition and communications during the war, which increased the importance of having military space systems that could survive a big war. Meanwhile, the Soviets continued to expand their own survivable wartime command and control system, including mobile as well as hardened elements.²⁶

In addition, two elements related to nuclear strategy and targeting policy came into renewed prominence during the Reagan period: the Strategic Defense Initiative (SDI) and nonnuclear attacks on strategic targets.

The debate over the Strategic Defense Initiative undoubtedly created the larger splash, as discussed by Leon Sloss in another chapter.²⁷ The Strategic Defense Initiative is still a research and development program, with limited impact on current nuclear force employment policy, but the potential impact is large. While much of the public discussion has focused on the question of whether or not strategic defenses could protect the U.S. population against a massive attack, more thoughtful consideration has addressed the costs and benefits of a defense against the more relevant cases of limited attacks.²⁸

A specific side effect of the development of SDI technologies was greatly improved capabilities for nonnuclear intercept of satellites. While the prospect of Soviet antisatellite (ASAT) operations added to the questions about the feasibility of a strategic defense system that included space-based elements, ASAT operations—and the defense of satellites—were becoming increasingly important as space became a more prominent area of military operations for both the United States and the Soviet Union.²⁹

The United States developed an air-launched ASAT system in the mid-1980s which was planned for use against Soviet satellites capable of locating U.S. surface naval forces. As Soviet surveillance satellites improved and U.S. strategic forces depended increasingly on mobility and concealment (notably through deployment of ground-mobile C³ systems or mobile ICBMs), it became increasingly evident that U.S. ASAT systems could play a critical role in protecting these forces from attack. In any case, the air-launched ASAT program was cancelled when Congress repeatedly refused to authorize its testing against targets in space on the grounds that it would start an ASAT arms race. The Soviets observed a self-declared moratorium on tests of their own ASAT system against targets in space, but their system had been

extensively tested before the moratorium. Development work continues in both countries on technologies relevant to future ASAT systems.

Strategic employment of nonnuclear weapons also came under discussion again during the Reagan administration. Although nonnuclear strategic bombing preceded the development of nuclear weapons, the distance from the United States to the Soviet Union and Soviet development of effective air defenses ruled out the repeated strikes needed to obtain effective results using conventional weapons with anything like World War II delivery accuracies. As far back as the early 1970s, however, the long-range research and development project led by Albert Wohlstetter and others for the Defense Advanced Research Projects Agency and the Defense Nuclear Agency highlighted the potential of the combination of precision guidance and long-range nonnuclear weapons for effective attacks on strategic targets.

The first fruits of that effort, the conventional variant of the Tomahawk Land-Attack Missile (TLAM), began to be deployed midway through the Reagan administration. This sea-based cruise missile has a precision optical guidance system and a range of approximately 700 miles. At about the same time, the Defense Science Board and the Commission on Integrated Long-Term Strategy supported further development of such weapons using advanced technology, particularly for deep nonnuclear strikes against the Soviet Union.

Meanwhile, two components of the U.S. military establishment were developing employment policies for nonnuclear strategic operations. The Strategic Air Command began planning for use of B-52s on deep conventional strikes in support of theater commands.³⁰ Not surprisingly, in light of extensive Soviet air defenses, emphasis was placed on the ability of the long-range B-52 to go around forward Soviet air defenses and use precision standoff nonnuclear weapons to attack targets while avoiding rear area air defenses.

Submarines are an even more traditional element of (nonnuclear) strategic warfare, going back to German efforts to blockade Britain in World War I. Economic blockade of a continental power like the Soviet Union never, of course, seemed promising, but the increasing Soviet reliance on SLBMs induced the U.S. Navy to develop the capacity to attrit Soviet nuclear-powered ballistic missile submarines (SSBNs) during an extended conventional war. Strategic antisubmarine warfare became an explicit element of the U.S. Navy's maritime strategy during the mid-1980s, with the dual purposes of reducing Soviet nuclear capability and diverting Soviet naval forces from offensive missions to defending their SSBNs.³¹

Implications for the Future

Fred Hoffman focuses on the future of nuclear strategy in another chapter.³² A few reflections are, however, presented here.

One is the minimal mention of offensive arms control negotiations, SALT and the Strategic Arms Reduction Talks (START), in this discussion. As long as the numbers of nuclear weapons and delivery vehicles on each side remain in the many thousands, agreed limits on their numbers are likely to have only minor effects on strategy or employment policy. More important are total bans on specific types of forces, such as the ABM Treaty, which has stopped U.S. and Soviet deployment of ballistic missile defenses beyond one hundred interceptors, or proposed agreements that would effectively block missile testing or ASAT weapons development.

The main engines that have moved U.S. nuclear policy have been the continuing need to support Europe's defense against conventional attacks and coping with improvements in Soviet capabilities to make nuclear attacks against both Europe and the United States. With the disintegration of the Warsaw Pact, the historically important task for U.S. nuclear forces to compensate for NATO's conventional force weaknesses is diminishing. While the Soviet capability to attack the United States is still growing, it is unclear whether the Soviets can or will maintain this growth in light of their deep economic and political problems. A Soviet nuclear threat—and a Chinese one as well—will, however, continue to exist against our nonnuclear allies. Providing support to these countries, most importantly Japan and Germany, against nuclear threats will remain a function of our nuclear forces—and not only our nuclear forces.

U.S. defense policy must also recognize that a dangerous phase of proliferation is underway as several smaller powers develop nuclear, chemical, or biological weapons and acquire missiles for delivery of these weapons.³³ Some of these countries may someday pose a direct threat to the United States. Sooner, many will pose a threat to our allies and to our forward-deployed forces. Much attention in the years ahead will have to be directed to dealing with these dangers.

Notes

1. Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, vol. 37, no. 2 (January 1959), pp. 211-34.

2. Characterizing the doctrine of a command or service is a tricky business. The people within these organizations have a considerable variety of values,

attitudes, and expectations—almost as large a variety as in American society as a whole. Nevertheless, within a command certain values and operational codes tend to dominate and strongly affect the perceptions, attitudes, and actions of its members. These are created in large measure by learned experiences and interpretations of experience. Doctrine is, among other things, a codification of learning. Not everyone in an organization has, however, the same experience or derives the same lessons. Moreover, changes in organizational doctrine have occurred as the result of changes in technology, experience, and leadership. The past yields important information about possible future behavior, but it is far from a perfect predictor.

3. This theory assumed, unrealistically, that the adversaries did not have effective means to reduce the vulnerability of their forces as an alternative to costly increases in force levels and that there were no binding constraints on available budgets.

4. U.S. reliance on a small SLBM force could, however, result in the Soviets shifting their efforts to antisubmarine warfare forces. The effect of this shift might be no net reduction in Soviet military spending or even an increase.

5. During the course of the 1950s, U.S. nuclear weapons were developed and produced for many missions including air defense, antisubmarine warfare, and tactical delivery by land-based and carrier-based aircraft. The United States provided nuclear weapons to allied forces in NATO under a "two-key" arrangement that kept them in U.S. custody. By 1961, over 3,000 nuclear weapons had been deployed to Europe for use by U.S. and allied forces. By the late 1960s the total had risen to 7,000.

6. In the late 1950s, the supreme allied commander, Europe, then General Lauris Norstad, introduced the concept of a "pause" after a Soviet intrusion and before the unleashing of the full power of the West. The concept of the pause, although never clearly defined, recognized the possibility that deterrence could fail, that mistakes or accidents could happen, and that responsible governments had to have some alternative to immediate and total commitment to a devastating nuclear war.

7. This was a doctrine that could be undermined only by a growing Soviet ability to inflict damage on the United States. The major effort made in the 1950s to build a continental air defense system to exact high attrition from long-range Soviet bombers was never very promising. The prospect of effectively limiting damage through active defense was greatly reduced with the introduction of ICBMs because, in the 1950s, effective antiballistic missile defense seemed distant at best. The conclusion that damage limiting through active air defense was unpromising led to sharp and continuing cuts in the 1960s and 1970s, even though Soviet technological developments were less damaging to more modest and useful U.S. goals for active defense: protection of strategic forces or defense against small nuclear powers or accidental or unauthorized small attacks.

The growing Soviet capacity to attack the United States undermined even more the doctrine of attacking only Soviet cities.

8. The standard fiscal argument did not work well in this case since most of the cost of these weapons was in the budget of the Atomic Energy Commission.

9. By the late 1950s the idea that our strategic forces should be well protected and used in a controlled way had gained wide acceptance. But there were large differences in targeting concepts, described above. Meanwhile, the operators had to work with the equipment on hand, which was not very compatible with these notions of controlled use. Many of the warheads had multimegaton yields; missile accuracy was poor; manned bombers and unsheltered missiles, if not launched quickly, risked destruction; and low-level penetration of bombers meant ground or near-ground bursts, which produced extensive fallout.

10. Damage limiting was not abandoned altogether. It might be feasible under favorable circumstances, the most important of which were cases in which a mutual interest in survival produced mutual restraint in a nuclear war. But fallout protection was important for such cases, given the high weapon yields projected for Soviet strategic forces. Studies showed such protection to be highly cost-effective, but the combination of low confidence in the prospect of restrained behavior and the political costs of trying to get fallout shelters approved by Congress caused the Johnson administration to decide not to request them.

In 1957 an extensive fallout shelter program was advocated by the Gaither Committee as part of a larger program of strategic offense and defense, but it was rejected by President Eisenhower. There was a brief period of interest in shelters in 1961, during the time of greatest concern over the escalation of the Berlin crisis.

The principal exception to the movement away from the objective of direct damage limiting during the 1960s was the argument used in 1967 to justify building a thin ABM system mainly as an anti-Chinese defense, designed against a small, technologically unsophisticated nuclear power, but not against deliberate large attack by the Soviet Union. The alternative of a thick ABM defense against the Soviet Union was explicitly rejected by the Johnson administration and subsequent presidents until 1983, when President Reagan announced the Strategic Defense Initiative.

11. There was some confusion because Schlesinger also announced the development of a large nuclear warhead for Minuteman, a warhead that had transient utility for attacking some military targets such as Soviet hardened missile silos. Its value was transient because accuracy improvements increased the hard-target attack effectiveness of missiles without the need for larger warheads; improvements in accuracy also—and more powerfully—helped make possible large reductions in collateral damage. Schlesinger justified this warhead proposal in terms of perceptions of the U.S.-Soviet strategic balance; the Soviet missile force had a much larger payload capacity and larger warheads than did the U.S. one. The proposed large warhead should, he argued, be considered in the context of the Strategic Arms Limitations Talks (SALT), where we were trying to get Soviet agreement to reduce missile numbers and total payload. To get this reduction, we needed some counterforce currency to trade, which this warhead provided. It had nothing to do with flexible nuclear options. Nevertheless, the conjunction of these two policy pronouncements

caused some confusion in press reporting and hostility among those opposed to greater nuclear targeting flexibility.

12. In order for the Soviets to pursue a selective nuclear policy, they would need to be able to deliver a certain number of nuclear weapons of medium or low yield with precision and to practice restraint in a conflict by, for example, choosing targets so as to limit collateral damage. On the first point, the Soviets have long been improving the accuracy of their weapons and have made great progress. As for warhead yields, the weight and volume constraints imposed by having mobile missiles and of deploying multiple independently targetable reentry vehicles (MIRVs) have resulted in a Soviet trend toward smaller warheads in a significant part of their force. Moreover, the use of air bursts rather than surface bursts would both increase blast effects against above-ground military targets and reduce collateral damage from fallout. On the second point, although restraint in a nuclear war is by no means assured, it would be powerfully motivated by self interest; there is little in the record of the behavior of the Soviet leadership to suggest that they have a taste for suicide.

13. Zbigniew Brzezinski, *Power and Principle* (New York: Farrar, Straus & Giroux, 1983), p. 157.

14. *Ibid.*, p. 455.

15. Harold Brown, Secretary of Defense, *Department of Defense Annual Report: Fiscal Year 1982* (Washington: U.S. Department of Defense, June 19, 1981), pp. 38-40. Development of selective nuclear options during the Carter administration represented a tactical alliance between three partially overlapping groups: those favoring selective nuclear options against conventional attack on Europe, those who worried that the Soviets might gain advantages in a selective nuclear campaign, and those who did not believe in a selective nuclear campaign, but feared that the Soviets might believe in one and that it was necessary to indulge that possible belief in order to have confidence in our deterrent. Harold Brown himself perhaps belonged in the last group. See Albert Wohlstetter and Richard Brody, "Continuing Control as a Requirement for Detering," in *Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington: Brookings Institution, 1987), pp. 150-51. For a view from one of Brown's principal subordinates in these matters, see Walter Slocombe, "Preplanned Operations," in the same volume, esp. pp. 127 and 141. For an analysis of the continuing implications of these three different schools concerning the role of selective nuclear options, as well as analysis of the views of those opposed to all selective nuclear planning, see Albert Wohlstetter, "Bishops, Statesmen, and Other Strategists on the Bombing of Innocents," *Commentary*, vol. 75, no. 6 (June 1983), esp. pp. 30-33.

16. Brzezinski, *Power and Principle*, p. 459.

17. Concerning the latter, see Richard L. Garwin, "Launch Under Attack to Redress Minuteman Vulnerability?" *International Security*, vol. 4, no. 3 (Winter 1979/80), pp. 117-39.

18. *Soviet Military Power: An Assessment of the Threat, 1988* (Washington: U.S. Department of Defense, 1988), p. 60.

19. Brzezinski, *Power and Principle*, p. 455.
20. *Ibid.*, p. 459.
21. For discussion of this approach, see Slocombe, "Preplanned Operations," pp. 123-29.
22. Fred S. Hoffman and Henry S. Rowen, *The Future of Containment: America's Options for Defending Its Interests on the Soviet Periphery*, Report by the Offense-Defense Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988), pp. 77-78.
23. *Report of the President's Commission on Strategic Forces* (Washington: U.S. Department of Defense, April 1983), pp. 12-15.
24. Hoffman and Rowen, *Future of Containment*, pp. 106-107.
25. *Ibid.*, p. 106, and Rear Admiral William J. Holland, "The End of the Triad? Why SSBN Advances Make a Dyad Possible," *Arms Control Today*, vol. 19, no. 7 (September 1989), p. 11.
26. *Soviet Military Power, 1988*, p. 60.
27. Chapter 4, "The Ambiguous Role of Strategic Defense in U.S. Strategy."
28. Fred S. Hoffman, *Ballistic Missile Defense and U.S. National Security*, Summary report: Future Security Strategy Study (Washington: U.S. Department of Defense, October 1983), pp. 7-8, and Hoffman and Rowen, *Future of Containment*, pp. 113-27.
29. Office of Technology Assessment, *SDI: Technology, Survivability and Software* (Princeton: Princeton University Press, 1988). On ASAT operations, see Albert Wohlstetter and Brian Chow, *Recommended Changes in U.S. Military Space Policies and Programs*, A paper by the Working Group on Technology, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988).
30. John D. Morrocco, "Air Force Approves SAC Plan to Modify B-52G Bombers for Conventional Role," *Aviation Week & Space Technology*, vol. 129, no. 1 (July 4, 1988), pp. 47-48.
31. Admiral James D. Watkins, "The Maritime Strategy," in *Maritime Strategy, Supplement to U.S. Naval Institute Proceedings*, vol. 112, no. 1 (January 1986), pp. 2-17.
32. Chapter 11, "Deterrence, Stability, and Reassurance: U.S. Nuclear Strategy After the Fall of the Soviet Empire."
33. Proliferation of advanced technology weapons is discussed in more detail by Jed C. Snyder in Chapter 14, "Weapons Proliferation and the New Security Agenda."

4

The Ambiguous Role of Strategic Defense in U.S. Strategy

Leon Sloss

Wild Strawberries

Strawberries—wild strawberries. That is one of my earliest memories of Albert and Roberta. I had been summoned to the heights—that is, the Wohlstetter home—atop Beverly Hills. Serious matters of nuclear strategy were on the agenda. As was so often the case with the Wohlstetters, however, a good meal came first. In this instance it was breakfast from the hands of Roberta herself. I do not remember all the details of the meal. I know that it was substantial and that it was elegant. What I do remember is the wild strawberries (fraise des bois, Albert would remind us), fresh from the Wohlstetters' garden. They were good enough that the memory, even a hint of the taste, lingers some twenty-five years later.

* * *

Introduction

Since World War II the most persistent concerns of U.S. national security policy have been the closely related problems of managing a competitive relationship with the world's other major superpower and coping with nuclear weapons, the most powerful military capability ever devised by man. We have come to rely heavily on nuclear weapons as both a symbol of power and a mechanism to keep the peace. At the same time, we have come to fear nuclear weapons, many seeing them as a major threat to peace, and have constantly sought ways to control or reduce nuclear stockpiles.

This love-hate relationship with nuclear weapons is reflected in ambiguous attitudes toward strategic defense. Two parallel but quite

different debates about strategic defense have raged over several decades, one in the public arena and the other among experts.

Public attitudes, as reflected in polls, have generally shown support for strategic defense. A prime example was the public support for President Reagan's Strategic Defense Initiative (SDI) in the early 1980s. There have, however, been some notable exceptions, such as the public outcry against civil defense in the early 1960s and the opposition in the late 1960s to antiballistic missile (ABM) deployments in those cities where the system was to be deployed. But, in general, public support for the idea of defending against nuclear weapons has been strong and persistent.

Among the community of civilian defense and arms control experts, on the other hand, there has been an outspoken faction strongly opposed to strategic defense since the 1960s. Furthermore, the military services seldom have shown much enthusiasm for defense, fearing that it would compete with more favored programs. Expert opposition to strategic defense has been even stronger in Europe than in the United States. Yet, there has also been a small but highly vocal corps of strategic defense advocates in the United States who have pursued the goal of creating and deploying defenses with an almost religious fervor.

Albert Wohlstetter, while not among the strategic defense zealots such as Daniel Graham and Edward Teller, has long argued against those who would curb strategic defenses on the grounds that they were destabilizing or because to do so would facilitate arms control agreements. He has helped to develop broader support for ballistic missile defense (BMD) with persuasive strategic and logical arguments. Indeed, in the path-breaking RAND basing studies of the early 1950s, Wohlstetter and his colleagues made the definitive case for defending strategic forces.¹

There have been four major phases in the debate about strategic defense. From 1945 until the mid-1950s strategic defense had high priority. The United States developed and deployed an air defense network and began preliminary research on ballistic missile defense.

By the mid-1950s a second phase had begun. It was becoming apparent that the future strategic threat would come primarily from ballistic missiles, and work on the Nike-X BMD system was accelerated. But deployment of ABM systems and civil defenses faced strong opposition. There were extensive debates, culminating in Senate approval of deployment of the Safeguard ABM system by one vote in 1969. This phase ended with the U.S.-Soviet ABM Treaty in 1972.

During the third phase (1972–1982) interest in and expenditures for strategic defenses declined, and the one deployed ABM site at Grand Forks was dismantled, as were most of the nation's air defenses.

Since President Reagan's initiation of the SDI program in 1983 there has been a rebirth of interest in strategic defense and a major new debate on its pros and cons. This fourth phase also has produced significant technological advances. While the Bush administration re-oriented the SDI program toward more modest initial goals, it consumes a significant fraction of the research and development budget of the Department of Defense and remains a major target of those in Congress who would cut defense spending, particularly since relations with the Soviet Union have markedly improved.

While there have been periods of interest in strategic defense, during most of the postwar era there has been strong and persistent opposition in much of the scientific community, among arms control advocates, and in parts of the Congress. This opposition includes many military planners. It can be fairly stated that U.S. strategy has a strong offensive bias. While the country has consistently supported major increases in and modernization of strategic offensive nuclear forces, each major effort to develop strategic defenses resulted in sharp debate. Clearly, however, the U.S. aversion to strategic defense has not been shared by the Soviet Union, which has deployed extensive air defenses and the only currently operational BMD system in the world. Furthermore, as Samuel Huntington pointed out, this U.S. tendency to favor offensive capabilities in strategic forces contrasts sharply with a bias in favor of defense in planning conventional forces for theater operations.²

Dogmatic opposition to defense sometimes leads to curious positions, as Albert Wohlstetter noted in several articles.³ For example, some oppose defensive measures that could protect U.S. strategic offensive forces even while they advocate relying solely on a secure retaliatory force for deterrence. Defenses frequently are criticized as destabilizing, and those who advocate defending our society are often branded as warmongers. Why is opposition to strategic defense so strong? Why do so many people in the nuclear age continue to believe that the best defense is a good offense, even while the view grows that nuclear weapons are so dangerous that we need to give highest priority to their elimination?

This chapter explores the question of why the West in general, and the United States in particular, have maintained such a strong preference for strategic offensive forces and an apparent bias against defenses. It briefly traces the history of strategic defense in the West since World

War II, then suggests reasons why certain attitudes toward defense emerged and why specific programs have not come to fruition.

Phase I: The Era of Air Defense

Modern military history is replete with efforts to adapt strategy and forces to rapidly changing technology. In the decade after World War II there were two central issues for U.S. defense planners that were driven in important respects by emerging new technologies. One was whether to develop the H-bomb; the other was when to develop and deploy ballistic missiles. The two issues were closely related, for the successful development of the H-bomb permitted great reduction in the size and weight of nuclear weapons and thus made nuclear warheads on intercontinental-range ballistic missiles feasible. Developments in strategic defense were directly related to these two issues.

Immediately following World War II the manned bomber was the sole means of delivering nuclear weapons. The United States emerged from the war with a large, sophisticated bomber force and extensive experience with strategic bombardment. For a brief period America had a nuclear monopoly and a far superior bomber force to that of the Soviet Union, with much greater operational experience, although for several years after nuclear weapons entered the U.S. arsenal only a few U.S. bombers were equipped to carry them. During World War II the United States had created a rudimentary air defense system and, well before the war ended, it was recognized that the country could be vulnerable to air attack. The Battle of Britain had impressed the United States with the destructiveness of air attacks, the importance of air defenses, and the key role of technology, notably radar, in air defense. Consequently, in the postwar period the United States proceeded to develop the technologies on which modern air defenses are based.

As early as 1946 the army began to study advanced air defense missile systems, which ultimately became the basis for the first defenses against ballistic missiles. It was not, however, until it became clear that the United States would be faced with a serious threat from Communist adversaries that steps were taken to convert the available technology into deployed air defense systems. Soviet detonation of an atomic bomb and the Communist victory in China provided the impetus for a major national review of security policy that culminated in National Security Council memorandum number 68 (NSC-68), a high-level reexamination of U.S. defense programs. NSC-68 was followed by more detailed studies that ultimately led to major changes in the U.S. defense posture, including measures to protect the strategic bomber force and the

deployment of new warning systems and air defenses.⁴ The aforementioned RAND studies, under Albert Wohlstetter's leadership, played a major role in defining the needed improvements to protect strategic forces. These included the deployment of early warning systems in Canada, the creation of the distant early warning (DEW) system, and the automation and integration of air defense elements in the semi-automatic ground environment (SAGE) system, using the most advanced sensor, computer, and communications technology of the day. NSC-68 and subsequent studies also led to the development and deployment of new interceptor aircraft such as the F-89 Falcon and the F-100 Voodoo to replace aging World War II fighters. The army also began deployment of the first surface-to-air missiles (SAMs), including Nike-Ajax and Nike-Hercules, which provided the organizational and technical foundation for the early ABM systems.

The decision to place so much emphasis on air defenses was not, however, without dispute. There was a major debate over how much of the nation's resources to devote to air defenses as compared with strategic offensive forces. What should be defended and the effect of defenses on stability were also controversial. These debates foreshadowed the ABM debates of the 1960s and 1980s.⁵

Defensive programs resulting from NSC-68 were directed entirely against bombers, since the prevailing wisdom in the early 1950s was that rocket delivery of nuclear weapons at intercontinental ranges was not feasible. This judgment changed radically when the United States successfully tested its first H-bomb at Eniwetok in 1952 and proved that nuclear warheads could be carried by intercontinental ballistic missiles (ICBMs) in a test in May 1954. Since the Soviets had tested an H-bomb in 1953, radical changes in U.S. thinking about strategic defense were warranted.

Early U.S. doctrine governing air defenses concentrated on the defense of cities. It was only after the work of Albert Wohlstetter and his colleagues at RAND on the vulnerability of Strategic Air Command bombers that air defense doctrine began to recognize the importance of defending military bases.⁶ This work also led to the initial discussions of strategic stability in the writings of Thomas Schelling, Morton Halperin, and others on the concept of first-strike instability.⁷

Phase II: The Era of Missile Defense Development

By the mid-1950s it was clear to U.S. military planners that the impact of the H-bomb and the ICBM on U.S. national security had to be addressed. There was considerable debate over the future role of the ICBM relative to that of the bomber. Furthermore, it was

becoming increasingly evident that a large investment in an air defense system would be futile if Soviet ICBMs, with a greater capacity than bombers to penetrate defenses, would soon render it obsolete.

This led to an increase in ABM research and development. Air force leaders, noting their responsibility for the strategic offensive, believed they should also be responsible for strategic defensive missions. The air force thus accelerated work on a system known as Wizard which originated in 1946 as a response to the German V-2. But the army, seeking to enhance its nuclear role, argued that its responsibility for the defense of the continental United States should include ballistic missile defense, and began work on the Nike-Zeus ABM program, which was an outgrowth of its Nike-Hercules air defense system.⁸ After the Soviets launched Sputnik in 1958, defense secretary McElroy authorized the army to proceed with Nike-Zeus, which was making better progress than Wizard and had a successful predecessor in the Hercules. At the same time, the air force was instructed to scale down Wizard.

The Zeus ABM interceptor had a nuclear warhead and was capable of reaching targets outside the atmosphere much faster than Hercules. Yet many in the new Kennedy administration were not convinced that Zeus could meet the growing Soviet threat. Defense secretary McNamara's advisors were particularly disturbed by the army's tendency to measure Zeus's effectiveness against current Soviet ICBMs rather than against the more advanced capabilities that would exist when Zeus actually was deployed. They also questioned whether civil defense would not be more effective than an ABM system for protecting Americans against nuclear attack.⁹ McNamara and his advisors were troubled by the Nike-Zeus system's technical difficulties, such as its inability to discriminate between reentry vehicles and decoys, its apparent failure under system saturation, and the unreliability of its guidance systems. Moreover, many scientists and military officers recommended increasing the U.S. investment in strategic offensive forces rather than investing in defenses. Consequently, McNamara authorized funds for Zeus research and development, but held back funds for deployment.

Despite this opposition, the army argued that defensive technology could keep pace with an advancing offensive threat. They pressed ahead with the development of Nike-X, which used phased-array radars and more sophisticated guidance systems than Nike-Zeus. A new high-acceleration interceptor called Sprint could reach the upper atmosphere within seconds, permitting the defense to intercept reentry vehicles within the atmosphere, where drag would enhance the system's ability to discriminate between the lighter decoys and the heavier nuclear

warheads. The new, electronically steered radars enabled the system to handle a greater number of targets, thus addressing, if not solving, the saturation problem.

Some of McNamara's concerns about the technical feasibility of the Nike-Zeus system were reduced by Nike-X. But misgivings about strategic defense were not solely technical. McNamara also was concerned with the strategic, military, and arms control implications of ballistic missile defense.¹⁰ He doubted that defenses could limit damage to the United States and still be cost effective. Moreover, he was coming to embrace the strategic doctrine of assured destruction, which mandated that deterrence required no more than secure second-strike offensive forces. According to this view, if defenses threatened the opponent's ability to launch an effective retaliation, they led to crisis instability. That is to say, if either side lost confidence in its ability to retaliate after absorbing a first strike, the greater would be the threat to stability in a crisis, since each side would have increased incentive to strike first. McNamara was also concerned that an ABM defense would lead to an arms race, as he felt the Soviets would always deploy enough strategic offensive forces to ensure that a certain number could penetrate U.S. defenses.

Air force and Joint Chiefs of Staff (JCS) planners rejected these arguments, saying they vastly overestimated the Soviet capacity to modernize their offensive forces and arguing that there was little evidence the Soviets configured their forces in conformity with the U.S. assured destruction criterion. Even if an arms race ensued, they argued, in the long run it would favor the technologically superior United States.¹¹ Strategists, including Albert Wohlstetter, also took issue with McNamara's views on broader grounds. They questioned the validity of assured destruction, arguing that massive nuclear retaliation was not a credible response to many threats confronting the United States. Donald Brennan coined the acronym MAD for mutual assured destruction, reflecting his strong doubts about the rationality of the concept.

President Johnson favored deployment of Nike-X, and FY 1968 budget funds were allocated for production. Johnson accepted, however, McNamara's position that these funds should not be released until concerted efforts were made to engage the Soviet Union in bilateral negotiations aimed at limiting ballistic missile defenses. But the Soviets resisted entering into these negotiations. At a summit in Glassboro, New Jersey, Soviet Premier Kosygin was particularly adamant in his refusal to negotiate on defensive weapons, and it soon became apparent that the funds for Nike-X would have to be released.

Nonetheless, McNamara continued his effort to limit deployment of the system. Having been ordered by President Johnson to proceed with deployment, McNamara, in a speech to the San Francisco Press Club on September 18, 1967, delivered a scathing indictment of ABM defense. By this time he had abandoned the idea of limiting damage to the United States from a nuclear attack, concluding that it was not possible to achieve an effective defense at an acceptable cost. McNamara argued that the \$40 billion planned for Nike-X would be better spent to procure a secure retaliatory force, consistent with his assured destruction views. Only in the final section of his speech did McNamara reluctantly explain that, despite the deficiencies of defenses, the United States was going ahead with deployment of a "thin" ABM system, called Sentinel and configured for population defense, to protect the United States against the future threat of Chinese ICBMs.¹²

As plans for Sentinel became known, however, opposition to its deployment mounted in the Senate and among the public at large. The Senate was concerned with the system's cost effectiveness, particularly if civil defenses were not deployed; its potential for stirring crisis and arms race instabilities; and its technical deficiencies. Public opposition was mainly found in the cities where Sentinel was to be deployed; the citizens of Boston and Chicago literally took to the streets in protest.¹³

In response to this growing opposition, the Nixon administration revised the Sentinel concept, reducing its area defense component. Renamed Safeguard, the system was reoriented toward the Soviet threat, for China's ICBM program had not emerged as quickly as U.S. intelligence estimates had projected. Although Safeguard maintained a nominal area defense component, it was reconfigured primarily for point defense of U.S. ICBMs. The system used two interceptors, Sprint for point defense and Spartan for area defense, and included advanced-technology radars to enhance its capabilities against Soviet ICBMs carrying more than one warhead. On August 6, 1969, Phase I funding for Safeguard passed the Senate, with Vice President Agnew casting the tie-breaking vote.

Albert Wohlstetter played a significant role in the 1969 ABM debate. His testimony to Congress provided a sophisticated strategic rationale for ballistic missile defense and refuted many of the arguments from the scientific community about the system's purported technical deficiencies.¹⁴ In particular, he argued tellingly against the MAD doctrine and insisted that opponents of defenses relate technical assessments of ABM system performance to the strategic missions of the system. His critique of many of the detailed calculations of the Safeguard opponents was subsequently validated following an exhaustive inquiry by the

Committee on Professional Standards of the Operations Research Society of America.¹⁵ This experience with politically driven "scientific" analysis confirmed skeptical views long held and often expressed by Albert about the role of scientists in the formulation of strategy.¹⁶

Phase III: The Era of the ABM Treaty

Technical questions about Safeguard abounded, but the administration kept the system alive by emphasizing its importance as a response to the Soviet ABM system already deployed around Moscow. The administration also argued that Safeguard brought the Soviets to the negotiating table and kept them there. The Soviet Union had agreed to strategic arms negotiations in the summer of 1968, but the United States postponed these talks in protest of the Soviet invasion of Czechoslovakia in August. The talks finally began in November 1969, under the Nixon administration.

Almost four years later these Strategic Arms Limitation Talks (SALT) resulted in two agreements. An interim agreement limited strategic offensive forces to then-existing levels for a period of five years. The ABM Treaty, on the other hand, permanently limited each side to only two strategic defensive sites, one configured to protect the national capital and the other to protect a set of ICBMs silos. In 1974 the treaty was amended to permit only one site apiece. The Soviets have maintained and modernized their ABM system around Moscow, which consists of 100 Galosh interceptors, the maximum permitted by the treaty. The United States deployed Safeguard at a single site at Grand Forks, North Dakota, to protect ICBMs, but its cost and its technical limitations led to deactivation in 1976.

The ABM Treaty largely silenced U.S. proponents of strategic defense. It seemed to codify assured destruction as the basis of U.S. and Soviet nuclear planning and to symbolize the acceptance by both parties that strategic defenses are futile against unconstrained offensive threats. Arms control advocates believed the treaty amounted to mutual recognition that strategic defenses resulted in arms race and crisis instabilities; they also believed it would lead to negotiated reductions in strategic offensive forces.

In the following decade the United States behaved as expected by most of the treaty's proponents. The lack of congressional support for ABM research and development following the treaty, the subsequent reductions in BMD funding, and the completion of the virtual dismantling of continental air defenses, begun in the 1960s under McNamara, suggested that America accepted the underlying principle of assured destruction: mutual vulnerability, being a fact of life, should be made a strategic virtue. Nevertheless, the Nixon administration

began to explore doctrinal alternatives to assured destruction in the early 1970s, seeking more targeting options and generally greater flexibility for strategic offensive forces.¹⁷

The Soviets explicitly rejected assured destruction as the basis of their strategic force planning. It now seems plausible to speculate that they signed the ABM Treaty to put the brakes on superior U.S. ABM technology in order to permit their own to catch up. They continued to pursue advanced BMD research and development through the 1970s, periodically upgraded the Moscow ABM system, and deployed an extensive SAM network.

As for the claim that the ABM Treaty would pave the way for negotiated reductions of strategic offensive forces, these have yet to be realized by early 1990, although prospects now appear promising. Indeed, while the United States unilaterally cut back elements of its strategic offensive forces during the 1970s, Soviet programs continued unabated. Moreover, in the 1980s both sides pursued strategic modernization programs that increased the accuracy, yield, and survivability of offensive forces. Thus, neither of the two major goals of SALT were met.

Phase IV: The Strategic Defense Initiative and Beyond

On March 23, 1983, President Ronald Reagan reopened the BMD debate when he announced the Strategic Defense Initiative, an intensive research program to examine the feasibility of strategic defense of population. The administration maintained that the ABM Treaty had failed to contain the arms race and that emerging technologies could provide new opportunities for effective defense. Thus, the time had come to reevaluate the prospects for ballistic missile defense.

The ABM debate of the 1960s literally repeated itself in the early 1980s, often over precisely the same issues. The effects of ballistic missile defense on arms race and crisis stability, the technical feasibility of defense, and its cost were among the focal issues of the new debate. The BMD systems envisioned for the 1990s would, however, function quite differently from those of the 1960s due to advances in technology. For example, the interceptors would perform at much higher levels of effectiveness than Sprint or Spartan and most sensors could be based in outer space.

These new technologies provided fresh fuel for the debate. Proponents argued that exotic technologies such as space-based X-ray lasers and free-electron lasers meant that defense would now be technically feasible, where before it was not. Detractors pointed to these same technologies, which even the proponents acknowledged were years away from maturing, and dubbed the Strategic Defense

Initiative "Star Wars," an intentionally critical term that has stuck in the minds of the public and the media. While futuristic technologies such as lasers and particle beams have captured the interest of journalists and the public, many of the new SDI technologies that began to receive greater attention in the late 1980s are less exotic and closer to fruition: kinetic energy weapons, mobile ground-based and airborne sensors, mobile BMD launchers, and advanced computing capabilities, for example. As we enter the 1990s a new concept, called "brilliant pebbles," offers promise of a less expensive, but still very costly, defense using space-based, kinetic energy interceptors.

At first, the Reagan administration supported a comprehensive defense intended to limit damage to Americans against even a massive Soviet first strike. Over time, however, the administration cut back its SDI goals significantly, and the Bush administration supports a much more limited system. The initial goal now is a deployment that could defend only against small attacks. Congressional funding for SDI research has also been gradually scaled back, contributing to the more modest initial deployment goal. In 1985 the Reagan administration requested about \$26 billion for a five-year research program, but the Department of Defense will actually receive about half of that. In the process, the Strategic Defense Initiative seems to have lost much of its public momentum. The national consensus that Reagan seemed to have once formed in support of the SDI program is dormant, if not altogether dead, in this era of national belt-tightening.

The Soviets have sought to link a comprehensive strategic offensive arms control accord to SDI limits, stipulating that no agreement will be possible unless the United States agrees to restrict SDI research to the laboratory and to postpone defensive deployments for at least ten years. The United States has so far resisted any such linkages. In 1989 the Soviets appeared to retreat from their insistence on linking limits on strategic defense and space systems to an agreement on offensive forces in the Strategic Arms Reduction Talks (START). At the time of this writing it is uncertain how the SDI program will be dealt with in a START agreement, but it seems likely that some limits on testing will be imposed. It also seems that congressional pressure to reduce the SDI budget and defer deployment will intensify in this period of renewed détente.

The Case Against Strategic Defense: Some Familiar Arguments

There are three arguments that have been repeated most frequently in the debates about strategic defense since the 1960s. In fact, it is

striking how similar the arguments of the 1980s and 1990s are to those of the 1960s. The first is that defenses will not work; the second is that defenses will lead to increased arms competition; and the third is that defenses will increase the risks of war by making a first strike more attractive.

Strategic defense has become a very sophisticated matter indeed. Skepticism about how well a defense will work is not unwarranted. Frequently, however, those who make the argument that defense will not work do not specify what the defenses are supposed to do. Whether or not a defense can "work" depends on the job it is being asked to perform. Defense of a hardened point target against a limited attack is considerably easier than defending a nation against thousands of warheads. Another favorite tactic of opponents of defense is to postulate such a demanding role for defenses that their inability to work becomes tautological, although some advocates of defense also have set unrealistically high requirements and thus have provided ammunition for the critics. The relevant question is whether the tasks a specific defense can be expected to do are worth the cost. To make this evaluation requires specifying a mission, estimating capabilities and costs for accomplishing the mission, and comparing these calculations with alternative means of accomplishing the same mission. Seldom is this done by those who claim that defense will not work.

The contention that defense will not work is meaningless unless one relates that argument to a specific time period as well as to specific roles. Albert Wohlstetter has made this point cogently.¹⁸ There are some tasks that defenses could carry out today. Other tasks might be possible in a decade. Still others probably never can be accomplished.

Those who are concerned about defense creating a new arms competition assume that defenses will force the adversary to respond in some way. A nation facing a strategic defense deployment may deploy its own ballistic missile defense, increase its offensive forces, or take steps to minimize the effectiveness of the opponent's BMD system. If such measures are pursued, however, it would mean that the defense was effective enough to require a response. This is contrary to the view of those who claim defense will not work. Thus, it is surprising to find the same people often making both arguments.

In the past the concern about arms races has been linked to the fear, sometimes implicit, that greater competition will lead to an increase in East-West tensions. It is debatable whether arms competition created political tensions; indeed, the U.S. willingness to compete in recent years (the SDI program is but one example) probably helped create today's situation in which East-West political tensions have substantially abated.

The prospect of an effective defense on one side is likely to bring a reaction from the other side, but of precisely what sort is not at all clear. Many defense analysts thought the Soviets would deploy a nationwide ballistic missile defense in the 1980s if the United States proceeded with SDI research and development.

While defenses can stimulate arms competition under certain circumstances, the record is mixed. For example, the United States did relatively little to respond to the Moscow ABM system. Since there are many examples of strategic offensive force actions that stimulate arms competition, it is not clear why defenses should be seen as having a unique effect on the process. In any event, the underlying causes of arms competition lie far deeper than the latest technical innovations, and these causes may be changing in the new political environment of the 1990s. Shibboleths about offense-defense interactions, never very persuasive in their earlier formulations, need to be reexamined in today's new environment.

Most strategists agree that the consequences of first-strike instability are more serious than the consequences of arms competition. Thus, the contention that defenses might increase the risk of war is a more important concern than the uncertain prospect that they might stimulate an arms race. The point made most frequently in this connection is that a defense which would not be effective against a massive first strike might be far more effective against a poorly coordinated retaliatory strike. Thus, the argument runs, a nation that deployed even a partially effective defense might be tempted to launch a first strike in a crisis, believing that its defenses could cope with the retaliation. But surely the dominant factor in determining whether or not to launch a nuclear strike is the consequences of doing so. Can anyone doubt that if the consequences would be severe, whether one goes first or second, deterrence is likely to prevail, at least so long as decision makers are even minimally rational? In today's circumstances, any nation contemplating the consequences of an attempted disarming first strike must assume that it will suffer massive damage in return. Both the United States and the Soviet Union have behaved for some years as though this were the case.

Defenses likely to be introduced in the foreseeable future will not change this picture in the case of a massive attack directed against cities. To this extent, those who argue that defenses will not work are correct. But they are correct only about a very specific and highly improbable case—a massive attack on cities. There are other, more limited, attacks that cannot be dismissed by military planners just because they seem improbable today. These include attacks by small nuclear powers and limited missile strikes by the Soviet Union. In

these cases defenses could be far more effective than in the case of an attack on cities and could serve both to deter more limited attacks and to limit damage if they occurred.

For years Albert Wohlstetter has played a leading role in calling attention to the possibility of less-than-all-out Soviet attacks on the United States and the implications this has for strategic defense.¹⁹ As he has pointed out, a massive attack against U.S. cities is not the only conceivable kind of attack that could be launched at the United States or even the most likely kind. More limited attacks are possible, and defenses that could be developed in the next decade might work quite well against them. Some strategists argue that limited attacks are not plausible, but Wohlstetter has long made the case that large nuclear attacks on cities are even less plausible, particularly if they can bring about large-scale retaliation. At a minimum, the argument that defenses might increase the risk of war in certain unlikely scenarios needs to be weighed against the argument that these same defenses could reduce the risk of a war in other scenarios.

Hidden Factors That Influence Views About Defense

There are hidden viewpoints and influences that shape the foregoing arguments. While these influences are more difficult to document than the arguments themselves, and thus are more speculative, they nonetheless provide insights into why certain views about defense are held.

Awe of Technology

The power of nuclear weapons is awesome and the formidable power of the bomb is married to other exotic technologies, including long-range, highly accurate ballistic missiles and space-based sensors. It is not surprising that average citizens and even many experts are skeptical about the ability of defenses to protect against such powerful weapons, particularly given the technical difficulties of creating a defense. Many of the skeptics have pointed out with considerable justification that, even if a highly effective defense against ballistic missiles could be deployed, there would still be threats from bombers and cruise missiles to be dealt with. This is true, although there are also ways to deal with these threats, at least in theory. Both air defenses and arms limitations offer promise of containing the threat from bombers and cruise missiles, although the technological problems and the costs of developing advanced air defenses are daunting.

Both the costs and the technological obstacles were formidable in the 1950s. Yet the United States undertook a major effort to develop

and deploy defenses against bombers that could deliver nuclear weapons. The history reviewed above suggests that it was not until the ballistic missile came along that many gave up on the feasibility of defense. The fact that the ICBM made U.S. air defenses and warning systems obsolete or in need of major modernization added to the sense of frustration and the belief that defense was futile in the nuclear age. Furthermore, many of the civilian and military leaders who influenced strategy early in the nuclear era, particularly those associated with the air force, were those who had designed nuclear weapons and ICBMs. They were biased in favor of the offensive technologies they had created and were reluctant to concede that defense might work.

The Appeal of "Simple" Deterrence

The idea that wars can be deterred by the threat of massive nuclear retaliation has a certain appeal. Given the immense power of nuclear weapons, it would seem logical that any rational leaders would be deterred by the prospect of their use. So long as a nation's destruction would be assured in the event of war, how can war any longer be considered as an instrument of policy? Indeed, the concept of assured destruction is derived from the doctrine of massive retaliation, which had some validity during the brief period when the United States enjoyed marked superiority in nuclear weaponry over all adversaries. It has little validity today, since it is based on a now faulty model, the flaws of which Albert Wohlstetter played a major role in exposing.²⁰

Those who advocate deterrence based on the threat of assured destruction of the opponent's cities often claim there is no alternative, that they are only describing reality. Their reality is, however, a world dominated by two superpowers who seem bent on total destruction of each other in a massive, spasmodic attack were deterrence to fail. This view ignores the fact that the capability for assured destruction is two-sided; Albert Wohlstetter frequently has pointed out that threats of massive retaliation can be self-deterring.²¹ Either side can inflict massive destruction if it uses a large number of nuclear weapons and if cities are the prime objective of the attack. It is not clear, however, what conceivable political objectives could be served by such attacks. Can deterrence be credible if the consequences of executing the deterrent threat are so devastating? U.S. assured destruction threats are particularly unbelievable when it comes to deterring conventional or even nuclear attacks on allies—the extended deterrence demanded by a number of U.S. international commitments, notably with respect to the North Atlantic Treaty Organization (NATO). When one looks beyond Europe, the plausibility of assured destruction threats to prevent

attacks by small or medium nuclear powers against their neighbors or U.S. forces overseas seems even more disproportionate to the likely stakes. Nevertheless, the appeal of assured destruction is pervasive, and it leads to the idea that defenses, which undercut the concept of assured destruction, are destabilizing. Why does this view persist?

The concept of assured destruction is simple—the requirements to fulfill an assured destruction strategy are easy to understand and calculate, are modest, and are relatively cheap. The introduction of defenses, however, greatly complicates this picture. To advocates of assured destruction, defenses not only threaten stability, but also threaten a well-established and well-understood concept. Because there has been no war between the superpowers “simple” deterrence appears to work, and this perception adds to the resistance to defenses. Even when it became clear that the Soviet Union was pursuing strategic defense energetically, many clung stubbornly to an assured destruction doctrine. One of the underlying reasons for this appeal of simple deterrence was the hope that if we could keep it simple the prospects for negotiating limits and eventually reductions on strategic arms would be enhanced. The matter of arms control and defense is discussed in more detail below.

Bureaucratic Politics

In the decade after World War II the air force exercised dominant influence over U.S. strategy. At that time it was widely believed, in the U.S. Air Force and elsewhere, that strategic bombardment had provided the margin of victory in World War II. For this reason and because it was in their interest in the battle over scarce resources to advocate a doctrine that emphasized aircraft, the air force played down the role of defenses and indeed denigrated their effectiveness. Although some air force officers saw the need for defenses to defend bomber bases, particularly after Albert Wohlstetter’s basing studies, they had little influence on the allocation of funds.

During the 1950s Eisenhower’s New Look doctrine, with its heavy emphasis on nuclear weapons, gave further impetus to an offense-dominated strategy. The navy, battling with the air force over doctrine and funds, was even more enamored than the air force with a minimum-deterrence strategy, for the relatively inaccurate submarine-launched ballistic missiles (SLBMs) of the 1960s and 1970s were only effective in attacks on soft targets such as cities. The navy’s position could not be ignored because, as the strategic bomber force became more vulnerable, the importance of the navy’s SLBM force grew.

The U.S. Army is responsible for ground-based air defense (i.e., SAMs) and for ballistic missile defense, but has always had mixed

feelings about this mission. While the strategic defense mission gives the army a foothold in the rarefied atmosphere of nuclear strategy, the ground combat officers who run the army usually are less than fully enthusiastic about it. Strategic defense competes with more traditional army functions for funds and manpower, and thus has always been an orphan in the army.

With no powerful bureaucratic supporters, strategic defense programs had an uphill battle to survive during the 1960s, particularly after McNamara decided to reduce spending on strategic systems that would limit damage from a nuclear attack on the United States. Following negotiation of the ABM Treaty in 1972, much of the political support for defenses faded away. Although its budget was limited, the army's Ballistic Missile Defense Systems Command nevertheless continued to work on such developments as the airborne optical sensor, which later became a part of the SDI program. But these efforts had little support at higher levels of the army. Even today, neither the SDI program nor the parallel air defense initiative (ADI) have much support in the army, except among the few specialists who work on these programs.

Controllability

As defenses became more sophisticated, it was necessary to develop complex computer programs to control them. This is seen as a liability by many political leaders and some military men. The argument has been made that a strategic defense system would have to be controlled by computers, and this makes people uncomfortable. While computers of necessity have a growing role in defensive systems, there are no currently deployed U.S. ballistic missile defenses and we do not know how such systems ultimately will be controlled. A high degree of automation is likely, but this would be less risky than computer control of launch decisions for strategic offensive forces.

Offensive systems have become more automated over time and their launch could be turned over to computers, but the United States has chosen not to do so because, if an offensive missile is fired by mistake, the consequences are likely to be severe. On the other hand, a computer mistake in a defensive system is likely to be less than catastrophic because the missile it fired probably would not land on hostile territory. Nevertheless, placing a BMD system on alert in a crisis with a higher degree of automated control could raise tensions. Furthermore, the image of having computers in charge of any strategic weapon makes people uneasy. This is not a trivial concern, particularly as we look ahead to the possibility of space-based defenses; but the fear of computers taking over the decision to start a nuclear war is an exaggerated one.

A BMD system can be designed to assure human control. The problem is to do so in a way that also assures a prompt, effective response. Nevertheless, the fear of computers taking charge has been used as a debating point to make people feel uneasy and thus to raise doubts about defenses.

Rejection of Vulnerability

Psychologists tell us that people do not like to be reminded of unpleasant possibilities such as their own mortality. Often they will go to some pains to avoid confronting such facts. The threat of nuclear war is one of the unpleasant facts of our time. People put it out of their minds most of the time, and it is fortunate for the mental health of society that they do so. Paradoxically, defenses remind us of our vulnerability to nuclear attack and, while BMD systems might reduce this vulnerability, the reminder seems more potent, particularly when no one can assure that defenses will work perfectly. This phenomenon was evident during the ABM debate of the 1960s and early 1970s, when some of the strongest opposition to ABM deployments came from the citizens who were to be defended. They were concerned that being defended would make them targets, whereas in fact they were being defended because they were near likely targets. Strategic defense could have reduced a risk inherent in their location; it did not create that risk.

The Mad Momentum of Arms Control

Most postwar American political leaders have had a fascination with arms control, and armies of experts have risen to feed the natural desire to do something about weapons of mass destruction. While, as Albert Wohlstetter suggests, arms control often seems to have a "mad momentum" of its own, it also has its theories. The governing theory among arms control experts is that defenses are destabilizing, a badly misused term that is seldom defined. Among many arms control enthusiasts, *destabilizing* seems to mean any action or idea that gets in the way of the next arms control agreement. In fact, as discussed above, defenses can either feed or dampen arms competition. Large defenses can increase first strike instability under certain circumstances, but as Wohlstetter among others has pointed out, first-strike instability occurs if offensive forces are extremely vulnerable and appropriately configured defenses can reduce vulnerabilities.

Why is it that arms control has such a fascination, even though the results of decades of negotiations have been relatively modest? Nuclear weapons still number in the tens of thousands and the potential

devastation of nuclear war has not diminished since negotiations about nuclear weapons began in the 1960s. In the minds of many, however, arms control represents the hope that we can somehow remove the nuclear threat under which we continue to live, an understandable desire. Few politicians are prepared to discourage these hopes and many are tempted to feed them. Yet, this is surely too ambitious a goal for arms control, one destined to lead to disappointment and frustration.

Albert Wohlstetter, Donald Brennan, and others have advocated a more realistic goal for arms control: to moderate the risks in a world in which deadly arms remain and dangerous rivalries persist.²² From this perspective, negotiations should seek to contain two risks: the risk of war and its devastation, and the risk that fear of war will unduly paralyze or distort state actions in times of peace or crises. Some of the agreements on crisis management and confidence-building measures (for example, agreements improving crisis communications procedures and facilities) probably have done far more to reduce both the risks of war and the fear of war than the more widely watched and closely followed strategic arms negotiations in Geneva. Given, however, the new political environment of East-West relations it now seems possible in START to achieve substantial reductions in nuclear forces. But reductions are not desirable unless they also result in a more stable nuclear balance. This should be our START goal. Meanwhile, we should avoid the temptation, against which Albert Wohlstetter frequently has warned, to seek agreement simply because it might improve relations. There are few, if any, agreements in arms control or any other field whose sole merit is their own existence.

Defenses also can contribute to both deterring war and reducing the devastation should war occur and thus can help reduce the fear of war. In this sense, defense should be seen as complementary to arms control rather than contrary to its objectives. If defense can make the outcome of an attack less certain for an attacker, it should add to deterrence. The main issue in recent debates is not whether defense could contribute to deterrence, but whether—if defenses were deployed on both sides—there would be a net advantage to the United States. Most national security experts, whether or not they favor strategic defense, now acknowledge that defenses can limit damage, possibly substantially. The main issue is whether the benefits to be achieved will be worth the cost, both in financial and strategic terms.

The Morality of Defense

Theologians and moral philosophers recently entered the debate about deterrence and defense. It has been argued that ballistic missile

defense is immoral because it increases the risk of war more than it reduces the consequences.²³ If this proposition could be proven, it might support the case against strategic defense, although even then one needs to apply the principle to specific wars and not just to the general concept of nuclear war. To the contrary, however, one can argue that strategic defense indeed is moral, as Albert Wohlstetter did in his article "Bishops, Statesmen, and Other Strategists on the Bombing of Innocents."²⁴

Furthermore, the judgment of how a given form of defense will affect the risks and the consequences of war requires complex technical evaluations on which even experts sometimes differ. Thus, it is difficult to provide a sound factual base for the arguments of these moral philosophers. Even if an agreed case could be demonstrated that defense increases the risk of war more than it reduces the consequences, there is no metric that allows one to determine whether the increased risk is worse than the decreased devastation. This is a matter of judgment.

Looking Forward

This chapter shows that there is a bias in U.S. strategic thinking that favors offensive over defensive systems in coping with the challenge of nuclear weapons and explains some of the reasons for this bias. Is this merely interesting history or is it relevant to the future?

Today we are entering a new era in our relations with the Soviet Union, and the roles of nuclear weapons and of defenses are certain to change as we move beyond containment. Already there is a tendency in some quarters to dismiss the threat of nuclear weapons and the need for defenses against them. Surely it is premature to reach such conclusions. Nuclear weapons will be with us for many years, probably in large numbers, even if strategic arms negotiations result in substantial reductions in U.S. and Soviet arsenals. And the further proliferation of nuclear weapons and ballistic missiles for their delivery remains a very real prospect.

The debate about how to deal with nuclear weapons will continue, and strategic defense will be part of that debate. The role of defense is likely to change in the new international environment, perhaps becoming more important as the offensive arsenals of the superpowers shrink, the technology of defense advances, and sophisticated weaponry proliferates. It is unlikely, however, that the past biases of U.S. strategy will disappear in the future. Perhaps, though, we can count on the clarity and logic of a few strategic thinkers like Albert Wohlstetter to keep the debate logical and honest.

Notes

1. Albert Wohlstetter, Fred S. Hoffman, Henry S. Rowen, and Robert Lutz, *Selection and Use of Strategic Air Bases*, RAND Report R-266 (Santa Monica, Calif.: RAND, April 1954). Also see Albert Wohlstetter, "The Case for Strategic Force Defense," in *Why ABM? Policy Issues in the Missile Defense Controversy*, ed. Johan J. Holst and William Schneider, Jr. (New York: Pergamon Press, 1969), pp. 119-42.
2. Samuel P. Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," *International Security*, vol. 8, no. 3 (Winter 1983-84), pp. 32-56.
3. Albert Wohlstetter, "Scientists, Seers and Strategy," *Foreign Affairs*, vol. 41, no. 3 (April 1963), pp. 466-78, and Wohlstetter, "Good Guys, Bad Guys and the ABM," *Los Angeles Times*, August 3-4, 1969 (published in two parts).
4. For a summary and analysis of NSC-68 and related studies, see Aaron Friedberg, "History of U.S. Strategic Planning Efforts," in Andrew W. Marshall and Charles Wolf, Jr., *The Future Security Environment*, Report of the Future Security Environment Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988), pp. 164-84.
5. For the history of the early ABM debates see Benson D. Adams, *Ballistic Missile Defense* (New York: American Elsevier, 1971) and David N. Schwartz, "Past and Present: The Historical Legacy," in *Ballistic Missile Defense*, ed. Ashton B. Carter and David N. Schwartz (Washington: Brookings Institution, 1984), pp. 330-49.
6. Wohlstetter, *Strategic Air Bases*.
7. Thomas Schelling, *The Strategy of Conflict* (Cambridge: Harvard University Press, 1960) and Thomas Schelling and Morton Halperin, *Strategy and Arms Control* (New York: Twentieth Century Fund, 1961).
8. A. J. Bacevich, *The Pentomic Era: The U.S. Army Between Korea and Vietnam* (Washington: National Defense University Press, 1986).
9. Schwartz, "Historical Legacy," pp. 333-34.
10. William W. Kaufmann, *The McNamara Strategy* (New York: Harper and Row, 1964), pp. 156-59, 229-32.
11. Schwartz, "Historical Legacy," p. 337.
12. McNamara's speech is included as a chapter in Robert S. McNamara, *The Essence of Security: Reflections in Office* (New York: Harper and Row, 1968), pp. 51-67. Interestingly, the section justifying an ABM defense against China is reprinted separately, as an appendix (pp. 163-66).
13. Ernest J. Yanarella, *The Missile Defense Controversy: Strategy, Technology, and Politics, 1955-1972* (Lexington: University Press of Kentucky, 1977), p. 152.
14. "Statement of Dr. Albert Wohlstetter," Senate Committee on Armed Services, *Hearings, Authorization for Military Procurement, Research and Development, Fiscal Year 1970, and Reserve Strength*, 91st Cong., 1st sess., pt. 2, April 23, 1969; "Statement and Testimony of Albert Wohlstetter," Senate, *Hearings before the Armed Services Committee, FY 1971*, 92d Cong., 1st sess., May 19, 1970.

15. Operations Research Society of America, Ad Hoc Committee on Professional Standards, "Guidelines for the Practice of Operations Research," *Operations Research*, vol. 19, no. 5 (September 1971), pp. 1176-77, 1191-93.
16. Wohlstetter, "Scientists, Seers and Strategy;" Albert Wohlstetter, "Optimal Ways to Confuse Ourselves," *Foreign Policy*, no. 20 (Fall 1975), pp. 170-98.
17. Leon Sloss and Marc Dean Millor, "U.S. Nuclear Strategy in Evolution," *Strategic Review*, vol. XII, no. 1 (Winter 1984), pp. 19-28.
18. Albert Wohlstetter, "Political and Military Aims of Offense and Defense Innovation," in *Swords and Shields: NATO, the USSR, and New Choices for Long-Range Offense and Defense*, ed. Fred Hoffman, Albert Wohlstetter, and David Yost (Lexington, Mass.: Lexington Books, 1987), pp. 3-36.
19. Albert Wohlstetter, "Alternatives to Mass Destruction as a Deterrent," in *The Military Dimensions of Foreign Policy*, ed. Fred Warner Neal, vol. 2 of *Pacem in Terris III* (Santa Barbara, Calif.: Center for the Study of Democratic Institutions, The Fund for the Republic, 1974); Albert Wohlstetter and Richard Brody, "Continuing Control as a Requirement for Deterring," in *Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington: Brookings Institution, 1987), pp. 142-96.
20. Wohlstetter, "Alternatives to Mass Destruction."
21. Ibid.
22. Wohlstetter, "Case for Strategic Force Defense."
23. Steven Lee, "Morality, the SDI, and Limited Nuclear War," in *Nuclear Deterrence and Moral Strength*, ed. Henry Shue (Cambridge: Cambridge University Press, 1989), p. 381.
24. Albert Wohlstetter, "Bishops, Statemen, and Other Strategists on the Bombing of Innocents," *Commentary*, vol. 75, no. 6 (June 1983), pp. 15-35.

5

Technology and U.S. Strategy

Jasper A. Welch

What Is Worth Thinking About?

In the spring of 1980 I made a rare trip away from my post at the Carter White House to seek Albert and Roberta's counsel on several vexing national security issues. I arrived in time for a wonderful lunch on the terrace of their home in Beverly Hills. After lunch my agenda was called for. Albert listened, reflected, but then waved my concerns aside. Instead, we spent the entire afternoon discussing what might be worth thinking about. The next morning, refreshed and stimulated, I had no trouble at all thinking through my agenda during the long flight back to Washington.

* * *

This chapter opens with a short description of technology as the prime mover of U.S. economic growth and national security after World War II. This was the milieu in which Albert and Roberta Wohlstetter grew to national prominence. Next the chapter examines the decline of technology as a prime mover after its headlong collision in the 1970s with concerns that:

- Technological pursuits were irretrievably damaging the world environment.
- The U.S. intervention in Vietnam was beyond the nation's proper role and its capability.
- The entrepreneurial spirit in both the private and the governmental sectors was out of control and needed containment via legislation and litigation.

This collision produced a severe and dangerous disaffection with technology in many quarters that persists today.

The bulk of the chapter examines the cultural, organizational, and policy impediments to the application of technology to solve problems of national security. Specific remedies for overcoming these impediments are set forth. Finally, the chapter looks at the future role of technology in serving national security. This look forward is made in only a very general way, for both the geostrategic and technological futures are likely to be quite different from the past. The nation has faced such a time before.

The U.S. Strategic View After World War II

After its victory in World War II, it took more than five years for the United States to come to a coherent strategic view of the world. The official pronouncement of national strategy did not occur until April 1950, when National Security Council memorandum number 68 (NSC-68) was issued. Paul Nitze has recounted how he, Dean Acheson, and the others so closely linked to NSC-68 worked long and hard to develop a realistic, coherent, and actionable strategy.¹

The changing events of the postwar world time and again sent them back to rethinking the fundamental challenges confronting the United States. In particular they kept trying to find a way to include some form of collaboration with the Soviet Union. Only when they admitted that the Soviet Union was determined to be our implacable, imperialistic foe did the strategy fall into place.

The essential ingredients included a bipolar world and the United States as the Free World leader with a clear action policy: containment of evident Communist expansion worldwide. The security context after the Korean War included strong communist governments in China and the Soviet Union, with large, seasoned, well-equipped military forces occupying Eastern Europe, the Baltic Republics, and North Korea. These occupations placed military pressure on all neighboring countries.

In the Free World, the governments and economies of Europe and Asia were generally weak and vulnerable to internal communist political and economic appeals. European colonies throughout the world were moving rapidly to sever the colonial ties which, for all their evident faults, had acted as a damper to regional disputes. With the withdrawal of European forces and influence, many of these disputes flared into armed conflict.

Taking these contextual factors into account, U.S. containment policy implied indefinite continuation of U.S. occupation forces in strategic areas, repeated and prolonged U.S. intervention into regional affairs,

and U.S. military, economic, and technical assistance of major proportions throughout the Free World.

In retrospect, it is remarkable that a strong U.S. economy manifestly capable of carrying out this containment policy emerged after the Great Depression of the 1930s and the economic dislocations of the war years. Many, including this author, attribute this fortunate historical progression to the effective use of technology. Effective use in the sense of building and motivating the economy of a large nation is not merely the choice between new and traditional products or the episodic exploitation of a few scientific breakthroughs. Rather, it is an attitude of profound dissatisfaction with the physical status quo. It is a commitment to search for new products, to experiment with innovative solutions to problems, to explore the ultimate limits of the underlying physical world.

Such an endeavor requires the dedicated efforts of the very best people. Moreover, if these intellectual pursuits are to be translated into broadly increased wealth, then appropriate underlying cultural values, economic motivations, and implementing organizations must also be created and preserved.

National Security Aspects of the World Role

Containment was not an offensive policy; it did not seek to roll Communist expansion back to the status quo ante. It did, however, seek to stop that expansion cold by using political, economic, and military assistance to noncommunist governments and institutions in the West. Put another way, the action policy sought to discourage and deter Soviet expansion and at the same time to encourage and reassure Western states to stand firm. This formulation, which we call the deterrence/assurance doctrine, has been ably described by Michael Howard.²

For the United States containment meant:

- Forward stationing of military forces to limit Soviet expansion.
- Bilateral and multilateral alliances dedicated to the containment policy.
- Maintenance of adequate standing forces and an organized mobilization base.
- Strategic mobility to bring the full weight of U.S. power to bear in applying the deterrence/assurance doctrine throughout the world.

These containment policies implied a number of specific U.S. actions toward the Soviet Union: a major surveillance effort to always know the status of the Soviet military apparatus; a major educational effort to understand the Soviet economic and political apparatus; isolation of the East from the Western economy; and a tight coupling of U.S. and allied military requirements to the strength and disposition of Soviet military forces. This last point bears elaboration. Its logical thrust is that it is both necessary and sufficient for the West to be able to *just* contain the East. "Sufficient" implies a policy of minimum containment. One could imagine another policy of overbearing, intimidating containment, but that is not what the U.S. government adopted, no doubt in sympathy with the reluctance of the U.S. people to assume Free World leadership in the first place.

The East, of course, was under no obligation to participate in or facilitate this Western policy, and it did not. The great sweep of intelligence evidence says that the Soviets indeed march to their own drummer—in quantity, in quality, and in style. Moreover, they openly disdain Western military thought, especially when it differs from theirs. This presents a problem in seeking to convince the Soviets that they are contained.

Nonetheless, direct military conflict between the United States and the Soviet Union has not occurred. But political confrontation of the opposing forces has occurred and in the West has spawned an intellectualization with two aspects. First, the construct of the arms race has emerged and gained some power. This construct notes the West's tight coupling of military requirements to the East and goes on to assume, contrary to the evidence, that the Soviets also have a policy of tightly coupling their military requirements to the West. Second, the construct of arms control has emerged as a solution to the asserted problem of the arms race. Albert Wohlstetter has exposed with thoroughness and insight the way these intellectual constructs have departed from the evidence.³

To be sure, there are data to show that the Western body politic feels enormously comforted by ongoing arms control negotiations. This comfort appears rooted in the assumption that the existence of negotiations implies that hostilities are not imminent. Roberta Wohlstetter revealed the problems with this assumption in her examination of the historical record of the Japanese-American negotiations prior to Pearl Harbor.⁴ There is also evidence, unratified Soviet-American treaties for example, that this same body politic is not so comforted by the treaties that actually result from these negotiations.

Thus, the combination of deterrence and assurance played a major part in carrying out the containment policy, and strategic bombardment,

particularly with nuclear weapons, had a crucial role therein. Without the means for strategic bombardment, in retaliation or in response to invasion, the West could not have had high confidence of underwriting deterrence of Soviet military expansion. Much of the seminal thinking to develop this role is found in Albert and Roberta Wohlstetter's work.⁵

Role of Technology in Meeting the Needs of Containment

Based on the experience of World War II and the Korean War, it was evident that the U.S. military faced a serious dilemma in striving to underwrite containment. The country needed a strong, standing, worldwide capability; but it needed to have that capability with only minimum manpower, certainly with a small fraction of the twelve million under arms in World War II.

To some visionaries of the time the solution to this dilemma lay in the exploitation of technology. World War II had seen a number of startling inventions: radar, jet engines, guided missiles, and nuclear weapons. It had also seen prodigious production of motorized vehicles and aircraft, as well as more traditional military equipment. Finally, it had seen the development of new organizational arrangements for stimulating, nurturing, adapting, and promoting technology for military purposes.

The lessons were clear and compelling to these visionaries. But in the decade following World War II their vision was widely ignored, misunderstood, and thwarted. Approval of many critical projects resulted only because of appeals directly to the top levels of government where, fortunately, the vision was generally grasped. Only when the Soviets revealed that they had nuclear weapons and later orbited Sputnik in 1957 was the American public seized with the urgent need to rely on technology for national security.

Five aspects of this reliance are worthy of note. First, the United States needed superior combat equipment in a one-on-one dueling sense. For example, our fighter aircraft needed to be better than those of the Soviets to be able to win consistently in an air-to-air engagement, to be able to carry more bombs farther, to deliver bombs with greater accuracy, and so forth. Similarly for tanks, ships, and other major combat systems.

Second, the United States needed to exploit the potential of nuclear weapons and nuclear propulsion. Nuclear weapons were seen to be the great equalizer in coping with larger Soviet forces; nuclear propulsion was the great bridger of distances from the United States to its worldwide points of containment and intervention.

Third, America needed to penetrate the Soviet veil of secrecy in order (1) to avoid the strategic and tactical surprises that plagued the West prior to World War II, (2) to have a confident yardstick against which to measure the adequacy of its forces (the necessary and sufficient condition to contain Soviet forces), and (3) to locate a suitable set of targets with which to underwrite the threat of strategic bombardment as an ultimate deterrent.

Fourth, the United States needed to exploit the concept of the guided missile to deliver just enough destructive power, to just the right place, at just the right time to achieve the desired damage *and* not to cause unwanted damage in the process. This is the "dual criterion" so ably and presciently formulated and explicated by Albert Wohlstetter.⁶ It implies that knowledge of the proximate purpose and context of the enemy's attack is central to the U.S. choice of response and that improving delivery accuracy is an enduring technical objective.

Fifth was the need to control hostilities, following the admonitions of Fred Iklé on control of war aims;⁷ to control unwanted damage in accordance with the dual criterion; to control forces deployed worldwide, using modern communications technology; to control nuclear weapons through the technical means of permissive action links pioneered by John Foster and Harold Agnew;⁸ and to adhere to the constitutional control of the civilian sector over the military that is so central to our national heritage.

In retrospect, the manner in which technology was pursued in the 1950s and 1960s sowed the seeds of difficulties that have grown to plague technology exploitation in the current era. In those days technology was almost universally perceived as a cost-avoidance measure. Technology was to reduce the need for large forces and large inventories of equipment; was to substitute a few nuclear weapons for large numbers of conventional weapons; and was to reduce fear and uncertainty in evaluating Soviet capabilities. Indeed, the technical advances made in those years really did reduce the cost of valued military capabilities, in some important instances by factors of ten to one hundred. As a result, little attention was paid to the cost of exploiting technology *per se* and how to do so more efficiently.

For example, the emphasis of the U.S. weapon system design process on countering Soviet weapons in head-to-head competition was short-sighted. It left U.S. forces with some awkward gaps in capabilities for jungle and desert warfare. The zeal to apply the nuclear solution to every combat need led to many highly visible nuclear weapon and nuclear propulsion projects being abandoned as technical failures or as unsuitable applications and, more importantly, it led to the long-term neglect of nonnuclear solutions. When we began to give more

attention to nonnuclear forces, the pursuit of missile accuracy for conventional weapons was too often at the expense of equipment reliability and of the capability to operate in poor weather and combat environments that were cluttered with noise. This, together with inattention to the surveillance and analysis capabilities needed to develop the target information necessary for accurate, effective attacks, led to skepticism as to the practical value of precision-guided missiles.

Nonetheless, during the 1950s and 1960s technology was widely perceived as essential. The major obstacle seen at the time was the lack of sufficient numbers of well-trained personnel. Students and the educational institutions responded well to the need. But by the mid-1970s a number of new impediments were beginning to surface that have grown in importance.

Impediments to the Application of Technology

The application of technology is very difficult. Many who try are often dismayed that success does not flow easily. They tend to blame some person, or organization, or regulation that is the proximate cause of their failure. But the truth is that too many approach technology application without fully understanding the scope of the enterprise.

In developing this judgment we first outline the scope of technology application; second, we provide some examples of these activities in the private and public sectors; we then describe some successful techniques for pursuing technology application within the federal procurement system; and finally we discuss some of the more critical current problems.

The Scope of Technology Application

The process of technology application can be grouped into four sets of related activities. They are presented sequentially below, but they must be planned as an integrated whole. Such a plan requires a wide range of data, diverse talents, and hard work. One must be prepared to abandon the effort in the planning stage if the pieces do not come together. Successful practitioners usually retain an essential degree of flexibility to adjust the integrated plan based on interim results. Moreover, when they have been successful, they usually declare their success to have been made possible by a few minor miracles.

The four essential groups of activities that constitute technology application are as follows. First is the production or creation of raw technology. This includes what is called basic and exploratory research in the Department of Defense (DoD). But it also includes the devel-

opment of fabrication, measurement, and diagnostic techniques that rarely would qualify for direct funding in the DoD research budget. The point here is that this raw technology is akin to a raw material—nothing can be made without it, but in its raw form the technology is not actually useful. Moreover, the additional activities needed to make it useful are arduous, demanding, intellectual, creative, and risky.

The second essential activity is market assessment and product definition. If a product is to be useful, then it must be able to fulfill a need. Market assessment is the process of discerning what needs are real but latent, awaiting the opportunity to be fulfilled by a new product. As a special case of market assessment we include the displacement of a currently used product by one that is better in one or more aspects. The other side of the coin, product definition, requires imagining what kind of products would fulfill these market needs. Increasingly, the successfully oriented products have a services component, so that for completeness the reader should understand *products and services* wherever we write the more compact term *product*.

Third is selling, distribution, and financing. The methods of sale, the means for distribution, and the sources of financing will always shape the product in important ways. The whole notion of mass production in the early twentieth century was built upon a foundation of organizations to sell and distribute the products and to finance the factories and inventory. In the application that is our interest, late twentieth century military products, the parallels are clear. Selling becomes the generation of military requirements, distribution becomes the integrated logistics and training system, and financing becomes the budget battle for congressional appropriations. The military product is, must be, and will be shaped by these processes as surely as by the underlying raw technology. Only by having some notion of how these processes will play out can one proceed with confidence to the next step.

This fourth step is product design, production, and testing. Product design is to many the creative heart of the application of technology. It is the thing that patent law was created to nurture. But even patent law recognizes that, in the phrase of its honored criterion, "reduced to practice," the invention counts only if it can be brought into the concrete world (production) and if the gadget can actually work (testing). Today, best engineering practice follows a process of concurrent engineering, by which is meant the design of the manufacturing process concurrently with the design of the product. This is indeed a key to low manufacturing cost. For our application we would add the necessity to design the test procedures concurrently with the product and the manufacturing process in order to aid in the selling and financing. For military equipments subject to arms control limitations, notably

intercontinental ballistic missiles (ICBMs), it is also necessary to design the verification monitoring procedures concurrently with the product.

Examples of Technology Application Activities

We are trying to teach one essential lesson: that all design activity—be it military or commercial—should take place not only in the full light of the available raw technology, but also with the correct understanding of the market and of the feasible methods for sales, distribution, financing, production, and testing. Much of the difficulty in applying technology lies in trying to follow a short cut from the raw technology directly to the product design. What happens then is that the designer unconsciously relies upon his own innate understanding of the market and the processes for sales, distribution, financing, production, and testing. His understanding, unfortunately, need not correspond to any reality. If not, then an acceptable product rarely results.

One of the most heralded examples of the failure to orient the product to the market is, of course, the early unsuccessful U.S. efforts to apply video-recording technology. The American inventors visualized the product as a luxury priced item, with playback only, for a sophisticated, highbrow audience. To the contrary, the Japanese product that actually succeeded, the VCR, is a low-priced item, with recording and playback, for a mass audience. Moreover, the Japanese product contains more technology than did the original American designs, much of it associated with manufacturing, reliability, and user friendliness.

Within the federal procurement system, just as in the private sector, all four groups of activities discussed above must still take place. But the bureaucratic setting generally obscures them and very often impedes honest efforts to accomplish them in a timely and orderly manner. At the core of the procurement system's difference from the private sector is the proper requirement to protect the public treasure from misappropriation for private gain.

As has been known for centuries, this proper concern has a strong tendency to result in unending accretion of specific rules to guard against the repetition of this or that specific abuse. The result is that money, time, and effort are surely spent (lost) on compliance in the hope that they will not be lost (spent) through fraud, waste, and abuse. The essence of this bureaucratic drive to order is substitution of rules for quality people.

Operating Successfully Within the System

Those of us who have been fortunate to witness at first hand the successful application of technology within the federal procurement

system know that personal excellence is at the root of all such success, followed closely by miracles and innovative circumvention of the system's worst manifestations.

Take first the military requirements process. It has both good and bad. One good part is that a thoughtful requirement can be an organizing principle for harnessing diverse contributors to the large, complex enterprise of developing a major weapon system. A bad part is the capacity for requirement promulgators who are fixed on their own pet solutions to thrive within this process. Rarely have they plumbed the depths of their own problems. As a result better solutions to the posited problems are disallowed *ab initio*, and, even worse, solutions to the true problems may never become available.

Much of the mischief arises from the bureaucratic presumption that the military user is the best judge of the true problem. This is compounded by three other most dubious assumptions:

- That the personnel currently assigned to the user organization are the people who best understand the true needs of that organization.
- That these personnel have been provided all the time and information they need to arrive at their judgments.
- That a requirement can and should be stated independently of the cost to fulfill it.

Today the military user is charged by statute, the Goldwater-Nichols Act, with being the promulgator of military requirements. The wise and innovative military user should concern himself with the dubiousness of the assumptions just listed. He should humbly seek the best personnel, give them time and information to do their job, seek outside counsel and criticism, and earnestly seek to establish a maximum price he is willing to pay for the solution to his requirement.

The notion of setting a price at the start of a technology application is quite foreign to the military requirements process. DoD regulations direct the assessment of costs and the comparison of costs with effectiveness, but cost is assumed to be an output of the design process. This formulation is bound to produce a design whose inherent cost is the largest that good engineering practice will support. The right formulation, one that will produce the lowest inherent cost, is to make price an *input* to the requirements process.

Setting a maximum price is common in the civil sector and essential to product planning. A proper price is crucial for the eventual approval of a military program by the Congress. This is becoming more widely recognized. For example, about five years ago, in recognition of this

need, the U.S. Air Force formally included setting a maximum price in its regulations governing the requirements process.

Whenever a ceiling on the price has been set, results generally have been good. For instance, in 1981 the revival of the B-1 program was made possible because President Reagan certified to the Congress that he was willing to pay only a certain amount for the program. The amount was more than 20 percent below the original cost estimate of the program office. To the air force this became a cost ceiling. To the program manager it became a mandate to innovate contractual arrangements and to streamline burdensome and costly compliance activities. As a result he was able to drive the program through on cost and on schedule.

One dark footnote: there was a serious electronic warfare technical deficiency in the B-1. But even this deficiency could have been avoided within the price constraint; it was caused principally by mistakes in judgment made by individuals. Such mistakes are regrettable, but they are not malicious and they cannot be eliminated by regulation.

More recently, during the summer of 1988, General Abrahamson broke a vexing log jam in the Strategic Defense Initiative by setting a price he was willing to pay for certain capabilities. It was a price well below the then-current cost estimate for equipment to provide those capabilities. The general was opposed with vigor, but he held his ground. Within the year he had several promising new system designs from which to choose, at prices he was willing to pay.

There are really two causes for these remarkable results. First, if one puts priority on price, then it follows that other requirements are less important and their satisfaction can be shaded or even abandoned. Second, and usually more important, creative individuals can and will think of approaches that really do cost less to do the job.

Nevertheless, there is always the need for oversight of the expenditure of public funds. This legitimate need is much more difficult to exercise than is generally believed. Many instabilities in the federal procurement system can be triggered by ineptness in oversight. For example, the overseer can completely undercut his own sources of data by "shooting messengers bearing bad news" or by failing to admit his own partial culpability when things go wrong.

Most recently, the pernicious notion has been perpetrated that all program difficulties are the result of ethical or criminal misbehavior. It is a notion perpetuated by those who either do not know the truth or do not choose to acknowledge the truth. In the complex world of high-technology applications, the principle issue is lack of excellence, not lack of morality. A reputation for technical competence and mature

judgment requires years of arduous work. No reasonable man would throw away such a hard-won treasure for a shady deal.

All this being said, there remains the fact that the federal procurement process continues to show distrust and to drive away from public service the only hope for a successful stewardship: competent people. There is a trend toward increasingly counterproductive micromanagement, and increasingly guilt is assumed until people are certified innocent. Should the current trend continue, our country will be unable to provide for its own security.

In pondering the wisdom of the federal procurement process, it is most instructive to note that virtually no important program has been allowed to use the approved process. Notable examples are ICBMs, intelligence programs, nuclear propulsion, and submarine-launched ballistic missiles (SLBMs). Moreover, the success record of these "special management" programs is far, far better than those using the approved process.

The details of the management arrangements for these special programs differ, but they have three common characteristics:

- Key government and contractor personnel in the program office are exceptionally competent and remain with the program for many years.
- Information flow up and down the organizational chain is rapid, complete, accurate, and candid.
- The relationship between the government organization and the contractor organization is professional and correct, but not adversarial or antagonistic.

It is lamentable, in spite of these undisputed observations, that the federal procurement system continues to disregard these models as a basis for needed reform. The special procedures are no less auditable, they actually provide less opportunity for abuse, and they work. On the other hand, they are not egalitarian. They insist upon excellence. They insist on personal accountability.

Current Problems and Opportunities

Today, the loudest voices are not crying for technical excellence and personal accountability, but for a turning away from technology itself. Technology is seen by some as the problem, not the solution. To them technology is an irrational monster for whose taming rigid contract clauses and strict testing regimes are needed.

To be sure, we all are painfully aware of a number of high-technology programs that became disasters. But many of these disasters are traceable to a combination of individual and organizational ineptness. As discussed above, the key to protection against personal ineptness is creation of a professional climate that attracts better people. The key to avoiding organizational ineptness is basically the same, to get better people. But the organizational qualities so characteristic of the special management procedures outlined above are also essential.

Other high-technology disasters can be traced to a lack of humility in predicting the future. One characteristic of the approved procurement process is its insistence that one should be able to predict the results of technical activities, even those being undertaken for the first time. This flies in the face of common sense and of any understanding of the nature of human fallibility.

This issue has infected the process so deeply that program managers routinely avoid performing tests where adverse results might be used against the program. Even tests whose results are needed to resolve real uncertainties or to explore the limits of performance are avoided or postponed, lest the program suffer adverse publicity. At its heart this situation is a denial of the scientific method and will lead to intellectual stagnation and chaos.

The surge of technology application to national security in the immediate post-Sputnik era was guided by different precepts. For example, at the Air Force Weapons Laboratory we sought to have a test failure rate of about 50 percent.⁹ To us, a lower rate probably meant we were not pushing the frontier enough. Higher rates probably meant we were losing touch with reality.

Another contemporary problem concerns cost. Today, cost is too often considered merely as an output of the design process. It is not well recognized, even by product designers, that one should treat cost reduction as a technical opportunity. In too many organizations the cost analysis team is completely separated from the engineers. As such it is indifferent to the design process and is not an integral part of the search for a lower-cost solution to the problem. Further, if one is to pursue cost reduction as a technical activity, then the technical investigation will have to encompass the manufacturing process as well—that is, it must follow the precepts of concurrent engineering of both product and process.

There is a related opportunity for technical activity, one that will substantially aid life-cycle cost reduction, as well as make the product suitable for more applications. This is the opportunity to improve reliability, maintainability, and, to coin a word, *trainability* (being easy to learn to use). Again, far too often these aspects are not the object

of the best technical design effort or of enabling technology development. But there are large needs to be filled, and most technical efforts dedicated to improving reliability, maintainability, and trainability have yielded stunning results.

Finally, there is a serious problem in the fundamental way our engineering profession looks at the design process. It can be captured in the phrase "the cult of optimality." It is the predilection to describe the design process as a closed system in which the boundary conditions are fixed. The function of the design process is then to optimize some measure of merit, or several, within these constraints. Such optimizations are often elegant and can produce innovative and exciting designs.

The problem arises when the would-be purchaser, or user, or financier simply has a different view of the appropriate boundary conditions or measures of merit. Unfortunately, these actors have the bureaucratic or financial whip hand. They are free to have contrary views. Even attempts by a wary designer to get prior approval of design ground rules will not protect him and his project against a change of opinion by parties who are entitled to do so.

The essence of the solution is to treat the design process as an open system, with the boundaries, constraints, and measures of merit essentially uncertain. That is, the designer should seek ways to protect his effort and his product from the ever-changing tides of opinion and the unknowable future. This actually is not such a novel thought. We all know that we cannot predict the weather with certainty, so we buy a variety of clothes and carry umbrellas. Military tacticians know they cannot predict the enemy's actions with certainty, so they prepare for those contingencies in which they have reasonable prospects of success and limit their exposure to the rest.

For the equipment-design process, an open-system approach would *not* consist of generating a host of optimum designs, each for a different set of plausible design ground rules. Rather, it would seek to develop designs that perform well across a wide range of plausible ground rules; and it would work hard at understanding which ground rules are really plausible and to whom. The output of the process would then be a handful of designs, each of which performs well across different, but somewhat overlapping, sets of ground rules, and a rationale for why any unfulfilled ground rules might be discarded. The designer would let the rule setters choose which set of residual risks to accept. Nobody would claim to be perfect. Everyone would seek to be thoughtful and honest.

Such an open process is clear heresy in the approved federal procurement process, where the divisions of labor are strict and the future is the subject of regulation, not speculation. First, it puts the

designer in the business of understanding his client's business better than the client. Second, this process forbids the designer to make a take-it-or-leave-it proposition. Third, it admits to uncertainty about the future. But in the more robust parts of the civil sector such an approach is very much in the main stream.

Summing Up

The impediments to the successful application of technology are real. They arise from the great difficulty of the process. They are compounded by the widespread lack of understanding of the breadth and depth of the necessary component activities of the process. Both the organizers of the approved federal procurement system and many of those who practice within the system suffer from this lack of understanding.

The solutions all revolve around personal excellence, accountability, and humility. Organizational characteristics of openness, trust, and responsibility are necessary—both because these traits will benefit the process and because they are necessary to attract good people.

Technology for National Security in the Twenty-First Century

If we look far enough ahead, the path will always become hazy. So it is not a question of whether we are uncertain, but at what point we become uncertain. Today that point presses close upon us. Both the needs of national security and the prospects for raw technology are suffering from dislocation. But let us take stock of what we do know, so that we might see as far as we can with clarity.

The revolutionary events in Europe are startling. Their pervasiveness and their limitations are still to be known. We should all endorse the importance of the aspect singled out by James Schlesinger, "America has won the watch on the Elbe."¹⁰ That is, what we have been doing has worked and worked well. But the future calls for something different.

Our minimum task is to consolidate this victory, to ensure that its opportunities do not slip away, to make permanent what is now only temporary and tentative. Some events in Europe are irreversible, but they are only current manifestations. In themselves they only foreshadow the changes that are possible. Consolidation of victory means to accomplish our goals.

To do this we must be clear about our goals. We wish to ensure political freedom and economic health for the peoples of Eastern and Central Europe. We wish to ensure the security of all of Europe from

the intra-European wars of the prenuclear era. We wish to encourage Russia to renounce imperialism and abandon its grotesque economic concentration on the engines of imperialism. Finally, we wish to maintain our guard against any reversal of the current salutary movements of the Soviet Union toward our goals.

Outside Europe the changes in our security concerns are only slightly less dramatic and ever so ominous. There is the prospect of a radical reduction in active Soviet subversion, which is on the positive side. But there are serious developments on the negative side. In the Western Hemisphere there burns a drug-driven lawlessness of enormous danger to human life and freedom. In Asia and Africa there are fierce and growing regional disputes, with enormous suffering of innocent civilians. Throughout the world we see an increase in the level and technical sophistication of armaments. The most chilling aspect of this is the proliferation of ballistic missiles together with chemical and even nuclear warheads.

In approaching these challenges we should, as in the past, marshal all our resources: political, economic, and military. We should not think of technology for national security as being only a military matter. But that has never been the case and surely should not be so for the future challenges outlined above.

On the raw technology side, the major avenues of advance are shifting. Over the last fifty years the large gains were in the areas of matter and energy. There is now a clear shift in which the major advances are taking place in the worlds of information and bioscience. The social impacts of this shift are apt to be profound. For example, many of us are finding that a personal computer does not merely make our old work easier; it coaxes us to do different work. Because we can be productive in a new and more rewarding endeavor, we shift to it and leave our old work undone, rather than done sooner.

So too it will be in all technology applications. Kent Kresa saw this before most of us. In early 1981 he observed that, "Anything that can be seen on the battlefield will be shortly destroyed."¹¹ He went on to reason that the logical result would be to force the "things on the battlefield" to be stealthy (so they cannot be seen) or inexpensive (so they can easily be replaced when destroyed). Note that he focused on the accommodation to the new reality, not on the more immediate consequence, that current equipment will find the battlefield too lethal.

This ability to see beyond the immediate consequences will be necessary in the future world of technology. We can all appreciate Albert and Roberta Wohlstetter's ability in this regard. One of their efforts concerned the issue of plutonium recycling. They argued against recycling on the grounds that, taking account of all the system impacts,

its economic value was dubious at best, while the nuclear proliferation dangers were clear and terrible.¹²

A Final Remark

For those readers who expected a recitation of all the wonderful new pieces of technology that are currently exciting, apologies. That would have been an easy pleasure to provide. But the crises described are just too troublesome to leave untended. Technology, even after the pieces are invented and well known, does not apply itself. People must apply it and that is a difficult task. Today it is all the more difficult because of an erosion and distortion of our cultural institutions.

This is written in the hope that it will inspire us all to rebuild our cultural institutions. We should start by shouting to the world, "In technical matters, only personal excellence counts."

Notes

1. Paul Nitze, remarks at a Washington dinner given by the Council on Foreign Relations in honor of Nitze's fifty years of public service, March 12, 1990.

2. Michael Howard, "Reassurance and Deterrence: Western Defense in the 1980s," *Foreign Affairs*, vol. 61, no. 2 (Winter 1982/83), pp. 309-24.

3. See, for example, Albert Wohlstetter, "Is There a Strategic Arms Race?" *Foreign Policy*, no. 15 (Summer 1974), pp. 3-20 and "Rivals, But No 'Race'," *Foreign Policy*, no. 16 (Fall 1974), pp. 48-81.

4. Roberta Wohlstetter, *Pearl Harbor: Warning and Decision* (Stanford, Calif.: Stanford University Press, 1962). See also her "Cuba and Pearl Harbor: Hindsight and Foresight," *Foreign Affairs*, vol. 43, no. 4 (July 1965), pp. 18-29.

5. See, for example, Albert and Roberta Wohlstetter, *Controlling the Risks in Cuba*, Adelphi Paper no. 17 (London: International Institute for Strategic Studies, April 1965) and Albert Wohlstetter, Fred S. Hoffman, and Henry S. Rowen, *Protecting U.S. Power to Strike Back in the 1950s and 1960s*, RAND Report R-290 (Santa Monica, Calif.: RAND, August 1956).

6. Albert Wohlstetter, "Alternatives to Mass Destruction as a Deterrent," in *The Military Dimensions of Foreign Policy*, ed. Fred Warner Neal, vol. 2 of *Pacem in Terris III*, (Santa Barbara, Calif.: Center for the Study of Democratic Institutions, The Fund for the Republic, 1974).

7. Fred Charles Iklé, *Every War Must End* (New York: Columbia University Press, 1971).

8. Albert Wohlstetter and Richard Brody, "Continuing Control as a Requirement for Deterring," in *Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington: Brookings Institution, 1987), pp. 167-68.

9. As approved in April 1958 by Colonel Edward B. Giller, laboratory director, upon the recommendation of Major Lew Allen, Jr., Lieutenant William Whitaker, and the author, then a captain. Giller went on to direct technology development for the Central Intelligence Agency and the U.S. Air Force; Allen retired as chief of staff of the U.S. Air Force and became director of the Jet Propulsion Laboratory; and Whitaker is best known as the father of ADA, the Department of Defense's standard computer programming language.

10. James Schlesinger, Testimony before U.S. Congress, Senate, Foreign Relations Committee, March 7, 1990.

11. Kent Kresa, private communication to the author, February 1981.

12. Albert Wohlstetter et al., *Swords from Plowshares: The Military Potential of Civilian Nuclear Energy* (Chicago: University of Chicago Press, 1979).

6

Warning and Response

Richard Brody

The Roberta Wohlstetter

Several years ago, Roberta and I visited the office of the historian of the National Security Agency (NSA). In introducing ourselves, we noted that we were working on a project led by Albert Wohlstetter researching U.S. warning of past Soviet interventions in third world crises. The NSA historians acknowledged Albert in the vague way people react to a name that is justifiably famous, but that has little to do with their immediate concerns. Roberta, however, was immediately recognized as "THE Roberta Wohlstetter." It turned out that the NSA historical office was just then publishing the "Magic" intercepts of Japanese communications taken prior to the Pearl Harbor attack and Roberta's own book on Pearl Harbor was apparently in the forefront of their minds. After her introduction, the staff was very cooperative and intermittently throughout the day somebody else would be brought over from a neighboring office to be introduced to THE Roberta Wohlstetter.

* * *

Research on Surprise Attack in the 1950s

In the mid-1950s Albert and Roberta Wohlstetter were separately involved in the writing of what became seminal works on the problem of dealing with surprise attack. What was critical about both works was the consideration of warning and response together in the decision-making process. Warning is effective to the extent that it prompts useful responses in dealing with the *possibility* of attack. Specifically this means that, in improving the capability of our forces to deal with the threat of surprise attack, the development of responses that can tolerate false alarms while being able to deal adequately with true alarms is as important as measures to improve warning.

Of the two works, the justifiably acclaimed book by Roberta Wohlstetter, *Pearl Harbor: Warning and Decision*, is better known in academic circles.¹ While it was written in the 1950s, it was not published until 1962. Originally done in support of a broader RAND effort to develop responses to warning of attack on U.S. tactical air forces in Europe, it took the help of ex-RAND colleagues in the new Kennedy administration to finally clear it for publication—despite its being based totally on open sources.

Three critical and interrelated points were made in Mrs. Wohlstetter's book concerning the intimate interaction between warning and response in the U.S. decision process in 1941. The first is alluded to above: the American decision process was seriously confused by the degree to which intelligence and operations were treated as separate, unrelated entities. Second, the value of the substantial intelligence that pointed to an imminent Japanese attack was considerably reduced by the large amount of coincident intelligence that argued against such an event, as well as by the previous instances when apparently equally good intelligence had suggested falsely that an attack was imminent. Both of these factors illustrate the problem of distinguishing signals from noise in a confused intelligence picture, distinctions that are always much easier to discern in retrospect than in prospect.

The third crucial point developed in *Pearl Harbor* might be summarized as the problem of "Warning of what?" The surprise in the attack on Pearl Harbor was not that the Japanese attacked, but that Pearl Harbor was the target. Uncertain American knowledge of the fact of the coming Japanese attack was doubly insufficient when coupled with quite mistaken assumptions (1) about the manner of the Japanese attack and (2) that U.S. territory would not be the target for a concentrated strike at the start of the war. The situation was further obscured by the dissimilar perspectives of decision makers in Washington and the commanders in Pearl Harbor, not to mention the differences in information available at the two locations.

Albert Wohlstetter's *Protecting U.S. Power to Strike Back in the 1950s and 1960s* (coauthored with Fred Hoffman and Henry Rowen) was in its own way equally influential, albeit within a more restricted circle.² A top secret RAND study for the air force, it was approved for public release only in 1989 (though for about two decades it had been in the chrysalis stage of unclassified, but "For Official Use Only"). *Protecting U.S. Power to Strike Back* (also known by its RAND report number as "R-290") had a fairly narrow if important purpose described fairly well by its title, with the qualification that it addressed only nuclear forces, which in the heyday of massive retaliation was not so much of a qualification, but more on that below.

Protecting U.S. Power to Strike Back was a natural follow-on to an earlier RAND study by Albert Wohlstetter and his colleagues, *Selection and Use of Strategic Air Bases*.³ This earlier report made the point that the Strategic Air Command (SAC) bomber force of the early- to mid-1950s, which depended on forward bases around the Soviet Union, was extremely vulnerable to Soviet preemptive attack when at those bases. In large part influenced by that study, the Strategic Air Command shifted to operating the bulk of the bomber force from bases within the continental United States (CONUS). Even though U.S. bombers based in CONUS had to fly longer distances to their targets, they were substantially more survivable since fewer Soviet bombers had the range to catch them on their bases in a surprise strike. Those Soviet aircraft that had adequate range would have to fly much farther, leading to greater opportunities for extended warning of the attack.

Protecting U.S. Power to Strike Back evaluated the new SAC basing concept and, like its predecessor study, developed several concrete alternatives to improve it. But *Protecting U.S. Power to Strike Back* took a much more theoretical approach than *Selection and Use of Strategic Air Bases* to the problem of protecting the Strategic Air Command against surprise attack. The difference is in some ways reflected in the length of the two pieces: *Selection and Use of Strategic Air Bases* is about four times as long as *Protecting U.S. Power to Strike Back*. While lacking in the detailed analysis so evident in the earlier work, *Protecting U.S. Power to Strike Back* gained in perspective by focusing more on the forest than the trees.

Protecting U.S. Power to Strike Back made several fundamental points that paralleled those made in *Pearl Harbor*, not coincidentally as Albert Wohlstetter was continually involved in reviewing his wife's ongoing efforts and *Protecting U.S. Power to Strike Back* specifically cites her "to be published" book. Of critical importance to gaining warning was understanding the sort of attack for which one was looking. In particular, the problem of SAC vulnerability to intercontinental attack in the mid-1950s illustrated well the more general issue of the lesser-excluded case. SAC bombers faced a lesser threat when based in CONUS in the sense that fewer Soviet bombers could reach them. On the other hand, given the concentrated basing of SAC bombers in CONUS, a relatively few penetrating Soviet bombers could destroy them if they were caught unwarned, and the Soviets could "of vice a virtue make." They could more easily prepare a smaller attack covertly and launch it toward its targets with less chance of being detected. After destroying the bulk of the SAC bombers at their few score bases, Soviet nuclear forces would then have ample time to focus on other targets to complete their victory.

The inverse of this point is that excessive caution in planning to respond to ambiguous indications of a coming attack could guarantee surprise in practice. This is the false-alarm cost dilemma raised in the story of the boy who cried wolf. If one plans a major reaction to every warning of possible attack, one will have a large number of expensive false alarms—either accidentally or deliberately set off (more on this later). In practice, a large number of false alarms will likely lead to increasingly high requirements for confidence in warning before one acts at all. Planning for too much too soon can lead to doing nothing until too late.

On the other hand, if only a small enemy attack could have critical effect, it may be necessary to launch selected forces even on the basis of ambiguous indicators that have a high false-alarm probability. If that posture is to be maintainable, the reaction should be pared down as much as possible. For this reason, *Protecting U.S. Power to Strike Back* proposed separating SAC alert measures from the much more extensive U.S. air defense and civil defense alert actions. It also pointed out that there would be lower risk in launching strategic bombers on less-than-certain warning if one had confidence that they were launched "fail safe"—a concept in which authorization to launch for survival, which might be trusted to a lower level of command, is separated from the authorization to execute a nuclear attack, which would require that the bombers receive a subsequent order from a higher command level. In the absence of this further authorization, the bombers would return, thus failing in a safe mode.

The Limits of Warning

Perhaps the first step to a successful warning system is realizing what it cannot do, most particularly understanding its intimate dependence on the system for response to warning in almost all situations. There is some limited role for warning without response to avoid surprise in a purely psychological sense. For example, the United States may want to be informed about some third world conflicts for which no time-urgent action is needed. Since the United States is a global power, the president and the State Department should always be, feel, and appear informed about conflicts, even if America is not directly involved.

The type of warning the Wohlstetters studied had, however, much more immediate operational implications. The survivability of U.S. forces and more generally the effectiveness of U.S. military plans in many contingencies depend upon timely action. In such cases warning cannot stand on its own. To the contrary, warning is as warning does.⁴

The second basic limitation of warning systems forms the crux of the false-alarm problem. Even the term *false alarm* is misleading if it is taken to mean that better intelligence, delivered by more capable collectors or smarter analysts, could eliminate false alarms. Decision makers want to know if, when, and how an attack might be forthcoming. Ideally, they want a simple statement predicting the future exactly, so that an optimal counteraction can be chosen. Unfortunately, even the best possible warning system cannot reliably provide such predictions.

Warning systems can provide essentially two items of information, with varying degrees of precision and accuracy. The first is a description of what has happened, most particularly what changes there have been in an opponent's capabilities to attack. The second is a prediction of what will happen, based on an assessment of the opponent's intentions. But information on what already has happened and on current intentions are only partial guides to the future. An opponent may take actions to improve his capability to attack quite apart from any irrevocable intention to make such a strike. He may be exercising his forces. He may be collecting intelligence on our early reactions to warning. He may be deliberately spoofing us. In one instance, a report that noted a Soviet stand-down in aircraft operations offered two alternative interpretations: either they were readying for a massive attack or they were taking time off for a holiday. Perhaps most basically, an opponent may be intending to make an attack, but change his mind.

This last represents the weak link among capability, intentions, and predictions. Even if the first two are known perfectly, enemy leaders will generally have the ability—albeit at some cost—to change their minds. Rarely are decisions really irrevocable. Good decision makers never make up their minds until the last possible moment, keeping their options open for as long as possible. Changes in the readiness levels of their forces represent down payments on developing wider ranges of options that they will choose to exercise or not, depending on subsequent circumstances. In several past crises, including Czechoslovakia in 1968, the Arab-Israeli War in 1973, Afghanistan in 1979, and Poland in 1980, the Soviets began partial mobilizations apparently with at least three purposes in mind. Ideally, such mobilizations could have helped intimidate opponents without the need for actual conflict. In any case, they provided a noisy background against which it is harder for opponents to identify subsequent shifts to preparations for an immediate attack. Finally, partial mobilization provided a start toward subsequent full mobilization, should the decision have been made to invade.

The opponent's decisions are not independent of ongoing circumstances, and this gives a two-way character to the interactions between

warning and response. One of the most important factors in determining whether an opponent carries through with an attack will be his assessment of our readiness to defend against it. If we are ready, his prospects of success might be fairly low and his incentives to defer action correspondingly high. On the other hand, catching us momentarily unready may provide a fleeting opportunity for advantage from an immediate strike.

One may be quite aware of a coming attack, but still not be ready if the response cycle is too slow. This was the critical point of *Protecting U.S. Power to Strike Back*. We could only measure the effectiveness of our warning system if we understood the speed of our reactions, which for the Strategic Air Command in its routine posture at the time was several hours. In fact, through 1954 SAC planes were not routinely ready to fly and their atomic bombs were stored off base at only a handful of national sites. This was justifiably seen as a highly sensitive point—to the extent that the then top secret Killian Committee report on the threat of surprise attack could only allude to it in 1955 as follows:

One serious delay in the reaction time of the Strategic Air Command will be eliminated when nuclear bombs are more immediately available to the nuclear striking force.

It has been recognized that bombs and bombers should be on the same bases. Two members of this Panel have been briefed, by special authorization, on the plans, present and projected, of storing and making available the stock of nuclear weapons. It is essential that these plans be carried through as promptly as possible.⁵

In researching the basing studies, Albert Wohlstetter knew of this additional critical vulnerability of the Strategic Air Command, but was discrete in his published reports, even though they were classified top secret at the time. To the extent that these reports were designed to recommend future changes to the Strategic Air Command that would take years to accomplish, such discretion made sense. The Strategic Air Command recognized the problem of separating the bombs from the bombers and was then in the midst of a major program to build nuclear storage sites at all the main SAC bases. This program was completed in 1956, the year *Protecting U.S. Power to Strike Back* was published. To the extent that one is examining current vulnerabilities, however, and trying to anticipate what sorts of Soviet attacks would make sense, which is to say assessing operational warning, such information on U.S. response times would be vital.⁶

In a period of immediate crisis the actions taken by our side will be one of the most important factors in an opponent's decision making—and thus also important for the warning problems of trying to evaluate the implications of his partial mobilization actions and to anticipate his future decisions. *Pearl Harbor* illustrates this point in terms of the dependence of U.S. military intelligence in 1941 on intercepts of Japanese cables for their knowledge of the state of U.S.-Japanese negotiations, obviously a key input to any consideration of the likelihood of an imminent Japanese attack on the United States.⁷ (At that time there was no Central Intelligence Agency to act as a integrating nonmilitary source of warning.)

A second illustration of the interactive nature of the warning and response processes might be called the "dependent-probability paradox." An enemy may make plans to attack contingent on whether or not he can carry out mobilization without prompting counterpreparations by the defender, as the Japanese did in their attack on Pearl Harbor. If the defender's intelligence arm is compelled to estimate the probability of attack without any knowledge of the actions of its own forces, it is caught in a paradox. If intelligence warns of a coming attack and defensive counterpreparations are taken because of that warning, the attack might well be called off and it would appear to have all been a false alarm. If, on the other hand, intelligence provides no such warning, then the attack would more likely proceed and come as a surprise.

A perhaps unintentional illustration of the dependent-probability paradox came in the 1973 Arab invasion of Israel. In May 1973 suspicious Arab mobilization actions were taken seriously by the Israeli chief of staff, and he ordered an expensive partial countermobilization. Israeli intelligence discounted the danger, however, and in fact no attack came. The chief of staff was blamed for wasting resources on a false alarm. Five months later, in October 1973, the Arabs again began mobilization actions and again Israeli intelligence discounted them. The chief of staff went along with intelligence, but this time the attack came. In the face of the dependent-probability paradox, intelligence information may well appear, after the event, to have been correct only when it goes unheeded before the event.

The way to solve this paradox is to recognize that the process of deterrence does not stop once a crisis starts. To the contrary, it is in a crisis that deterrence is truly put to the test. Our warning and response system should be part of our apparatus for maintaining deterrence in a crisis. Our mobilization should reinforce the conservative tendencies of our opponent, convincing him that he is better off not attacking. A "false alarm" may in fact be a case of deterrence that

was successful only because of our timely response to timely warning. Unfortunately, as is usually the case with deterrence, it is difficult to relate success to any particular action. We may never know if the other side would not have attacked even if we had not responded to warning. Unfortunately, that is an inherent limitation on our knowledge. This reemphasizes the importance of having repeatable responses to warning, responses that, in particular, we will not regret having made should deterrence prove successful.

This last point suggests an important role for intelligence in resolving the dilemma of "too little, too late" versus "too much, too soon." While intelligence cannot tell us whether Soviet mobilization is "real," in the sense that an attack is really about to come, it should be able to say whether it is real in the sense that it involves real force actions. If we are to have responses that are as sustainable and as repeatable as the threats that might prompt them, we need to apply some standard of efficiency. We will never be able to afford to respond to every Soviet action as if it were a full mobilization. Hence, a key role of intelligence in supporting our warning and response system is to estimate the level of the increased threat, in order to support our ability to vary the response with the circumstances.⁸

Warning in the Theater and the Strategic Perspective

The terms *strategic* and *tactical* are responsible for many confusions in the national security literature. Among the most tangled is the relationship between these terms as applied to forces and as applied to warning. Strategic forces include delivery systems accountable under the Strategic Arms Limitation Talks (SALT) agreement: intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and heavy bombers. Tactical forces include such battlefield weapons as artillery, tanks, short-range rockets, and the like, many of which are nuclear-capable. Where the line is drawn concerning intermediate-range nuclear forces is not worth delving into here and tends quickly to become arbitrary. The important point is that these distinctions have almost nothing to do with strategic and tactical warning.

Strategic warning is warning of an attack in preparation. *Tactical warning* is warning of an attack already launched (it is preferable from the defender's point of view that tactical warning be given before the attack lands). Ironically, for most of the past quarter-century tactical warning has become particularly associated with the strategic forces. Indeed, the term *tactical warning systems* is typically used to refer to early-warning radars and satellites that can detect the launch of ICBMs or SLBMs.

The reasons for this pairing of tactical warning to strategic force attack have to do with the particulars of modern ballistic missiles, which have dominated strategic strike considerations for the past twenty-five years or so. Since large portions of the ballistic missile threat require no visible preparations to be launched, strategic warning for these weapons is recognized to be unreliable, hence is discounted. On the other hand, once launched, ballistic missiles are quite obvious to modern sensors. In the boost phase they exhibit large infrared plumes. When separated from the boosters, their warheads fly fast and high along predictable trajectories, making them near-ideal radar targets. Moreover, unlike unidentified aircraft, there are relatively few benign explanations for a sighting of many ballistic missiles in flight.

Of perhaps equal importance, once a ballistic missile is launched, it's all over but the shouting. Not only are they practically unrecalable and undivertable, they are already set in a predictable trajectory to a unique target at the time of launch. It is this predictable character to their trajectory that makes it possible for tactical warning systems, particularly radars, to double as attack assessment systems by predicting the impact points of the in-flight warheads and thus the targets at which they are aimed.⁹

On the other hand, in the early- to mid-1950s, at the time the RAND basing studies were being written, missiles were a future threat; the primary threat was enemy bombers. Since the Soviets did not normally keep their bombers at the high readiness typical of today's ICBMs, their preparations to launch an attack would have involved more visible preparations and might plausibly have provided strategic warning.¹⁰

More importantly, however, bombers present a more ambiguous picture once they have been launched. They take longer to fly from the USSR to the United States, providing a longer period of potential warning than ICBMs. They may not be visible, however, until near the end of their flight paths. By maneuvering, they can to some extent control when they become visible, although such maneuvers will be limited by the operating range of the bomber. By the same token, because aircraft can maneuver, seeing them in flight gives only the roughest idea where they are going, no matter how accurate the means for measuring their instantaneous position and course. Estimating raid size is difficult, because one may sight only a fraction of the incoming bombers at any one time. Moreover, sighting and identification may be quite different. Radar generally gives only location, course, and speed; it does not indicate whether the aircraft is an enemy bomber, a civilian aircraft that has strayed from its flight plan, or a drug runner. Finally, in-flight bombers can be recalled, so a sighting does not necessarily imply an attack. Indeed, standard planning for the United

States going back to the 1950s is for its bombers to be launched on ambiguous warning, with recall being automatic unless positive orders to proceed are subsequently given. It appears that the Soviets currently use a similar system for their bombers.¹¹

In many ways, the warning characteristics of strategic bombers closely parallel those of theater attacks, whether in Europe or the Middle East. As with strategic bombers, in the theater the attacker will have a range of choices, including a surprise, near-standing-start attack with ready forces (hoping that the initial advantage of surprise and the initial lead in mobilization will assure success in the subsequent operations) and mobilization before attacking (which will make more forces available to the attacker at the cost of greatly increasing the warning to the other side).

A major tradeoff is involved in this choice between a near-standing-start and a fully mobilized attack, one that concerns the issue of risky versus safe strategies. A standing-start attack, or one begun after a limited mobilization, may seem the more risky option in that it may seem safer to mobilize one's full forces than to take a chance on surprise working. If, however, full mobilization means giving ample time for the defender to mobilize, the end result may in fact be far riskier for the attacker. Mobilization may eliminate the chance for a rapid victory and introduce all the uncertainties that come with a lengthy war.

There are at least two circumstances in which striking suddenly may be safer. One is where no opposing forces are deployed at the point of attack in peacetime and providing warning would allow the opposition to mobilize and occupy the key points first. Historical examples of rapid attacks with limited preparations are Germany's attack on Norway in 1940 and the Soviet invasion of Afghanistan in 1979. Not coincidentally, both instances involved daring use of airborne (and, in the attack on Norway, seaborne) forces to capture key points far forward of the attacker's ground forces, which had to move over difficult terrain and were able to catch up only later. In both cases the objective was to establish a clear *fait accompli* before adversaries who had not been attacked could even consider whether they wanted to oppose the attack. In the case of Afghanistan the Soviet strategem deterred armed opposition by outside countries. In the Norwegian case the Germans occupied the dominant positions and were able to defeat limited Franco-British landing attempts at strategically less-important points, though the linkup of the main German force with the most advanced party at Narvik took weeks.

Norway might be a plausible place in which a sudden "daring" Soviet assault would be safer than a mobilized one, since, as before the German attack, no allied troops are deployed there in peacetime.

Another such place could be Iran, where a rapid Soviet strike led by airborne divisions could seize key points before the forces of the U.S. Central Command could be deployed.

The second circumstance in which an attack from a near standing start may be safer than an attack from a mobilized posture is the case in which it may seem the only way to win against a more powerful opponent. This is the situation Japan faced prior to its attack on Pearl Harbor. It is also the problem that faced the Soviet military command in planning a nuclear attack on the United States in the 1950s. Given the current military balance, however, there are few areas of the world where the Soviets would face this sort of choice today. But a near-standing-start attack may be the only way for the Arab states to win a war with Israel, for Pakistan to beat India, or, most notably, for North Korea to invade South Korea successfully.

The main risk in a surprise attack strategy is that surprise would fail. Indeed, the supposed advantage of a strategy of full mobilization is that it does not depend on surprise: one may miss the chance for great success, but one avoids the risk of the terrible failure of a daring strike running into a well-prepared defense. There are, however, historical and theoretical reasons for substantially discounting the risk that surprise will fail. In fact, surprise attacks have proved to be remarkably successful. A review of recent wars shows that a large number of them started out with a successful surprise attack and that relatively few began with an unsuccessful attempt at one; the Franco-British assault on Suez arguably is an exception. Perhaps much of the explanation of this phenomenon is that, with the exception of ballistic missiles, it generally is possible to call off a planned surprise attack if the defender seems forewarned and forearmed. (Explaining why most surprise attacks succeed is similar to the problem of distinguishing a successful case of deterrence from a false alarm.) To illustrate the point, when the Japanese armada was sailing toward Pearl Harbor in 1941 its orders were to call off the attack if it was discovered any earlier than one day before the planned date of the strike.¹² As it happened, of course, they were not discovered.

On the other hand, a successful surprise does not need to be a total surprise. That is to say, getting a substantial jump on the other side in terms of relative mobilization may not require a bolt-from-the-blue attack. In particular, a Soviet mobilization need not follow so obvious a pattern that we immediately recognize it and make an optimal response, with our own mobilization just peaking when the attack arrives. A Soviet mobilization may be partial; it may hold for a while; it may be reversed, with the readiness of the forces reduced for a time; and then the readiness of these forces may meander back up.

The Soviets can make it difficult for us to determine that mobilization actions are the prelude to an attack, particularly since they may have multiple motives for the mobilization activity, illustrating the broader point that a benign motivation does not automatically mean a benign action. Parts of the mobilization activity may look like an exercise. Other parts may look like a defensive reaction to U.S. or North Atlantic Treaty Organization (NATO) countermobilization actions.

A slow, unsteady mobilization strategy can be costly for the Soviets. But it can also impose costs on the would-be defender, who is faced with the need to repeat or sustain responses to this kind of Soviet mobilization, which can appear to be a repeated set of false alarms. Such a situation may be particularly difficult for a coalition like NATO, where responses must be negotiated, where the intelligence information required to convince U.S. allies of the need for mobilization responses may be shared only partially, and where the political costs of repeated responses may equal or outweigh the financial and military burdens.

In fact, an opponent will have every incentive and multiple means to cloud our warning process. To cite the 1955 Killian Report again:

He can be expected to design any surprise attack to engender ambiguity in our early warning signals. He may discover and proceed to tantalize our indicator boards. He may disrupt our communications, even probe our radar nets, without making war. He may appear bellicose and then turn reasonable again and again.¹³

A major advantage of a slow but *unsure* mobilization approach designed to maximize ambiguity is that it fits well with the usual practice of dealing incrementally with a developing crisis. An opponent would normally take partial actions to increase his options well before making any final decision to attack. This is probably the best explanation of the extended Soviet mobilizations against Czechoslovakia in 1968, Afghanistan in 1979, and Poland in 1980–1981. If an attack eventually comes, it would most likely be as a combination of the slow and fast models—with a gradual and uneven mobilization while the attacker is taking conditional preparatory steps, then a sudden switch to a fast, final mobilization effort for a near-immediate strike once the decision to attack is made.

Strategic Warning and the Theater Perspective

As noted above, the warning situation of the 1950s, in which the primary means for strategic strikes was the slow-moving, recallable bomber, in many ways provides more insights for theater warning and

response problems than does the current strategic strike warning situation, which is dominated by the threat of large-scale ballistic missile attack. But the problems associated with warning of theater attacks and strategic attacks arguably are reconverging for two reasons, one technical, the other operational.

The technical reason is the return to prominence of the aerodynamic threat (bombers and cruise missiles), beginning with the U.S. and Soviet deployment of long-range, air-launched cruise missiles. This was a particularly significant event on the Soviet side, since it was their first new air-strike system directed primarily against the United States in over twenty years. At the same time, technology developments suggest that there may eventually be a reversal in the relative penetration probabilities of aerodynamic and ballistic strike systems. Traditionally, ballistic missiles have been virtually unopposed by defenses, while air defenses could inflict heavy attrition on bombers. Strategic Defense Initiative technologies raise, however, the possibility of effective ballistic missile defenses, while stealth technologies promise to reduce greatly the attrition imposed by air defenses.

Perhaps more significant than these technical trends is the operational fact that the neat division between strategic and theater attacks is becoming blurred. Strikes with "strategic" weapons (ICBMs, SLBMs, and heavy bombers) are becoming more important for support to theater campaigns around the Soviet periphery. Strategic forces have, of course, always been relevant to overseas theaters. The need for strategic strikes has been most likely to grow from a theater war. Moreover, the Soviets have always placed their deep theater strike forces (intermediate-range missiles and medium bombers) in the same command as their ICBMs and heavy bombers.

While it has always been recognized that a strategic war would most likely grow out of a theater one, the traditional view has been that, once the strategic exchange started, it would dominate all that came before it. When a man is shot to death while being robbed, it is more likely to be considered a murder than a robbery. This traditional view was based on the assumption that a strategic exchange would be a massive one or at least that the threat of its becoming so would dominate all other considerations. But this need not be so. A selective strategic strike on such targets as space launch centers or certain military aircraft bases may be useful in support of a theater commander's campaign, as a kind of long-range artillery, while doing relatively little damage to the surrounding society.¹⁴ Use of strategic nuclear forces for theater purposes will become more important as forward-deployed theater nuclear forces are progressively withdrawn.

Massive strikes make sense if one is faced with a "launch-it-or-lose-it" situation where one side could substantially destroy the other's strategic ability to counterattack. While this situation had a large measure of relevance in the 1950s and early 1960s, Secretary of Defense McNamara already anticipated that "... a counterforce strategy [that is, 'hitting only military targets'] is most likely to apply in circumstances in which both sides have the capability of surviving a first strike and retaliating selectively."¹⁵ A U.S. countermilitary strategy was formalized in the Schlesinger doctrine for selective use of strategic forces in support of the NATO theater.¹⁶ To the extent that strategic strikes become a subordinate part of theater operations, the warning situations become driven less by features peculiar to strategic forces and more by the complex range of factors related to theater mobilizations and campaigns.

"Warning of What?" and the Escalation Problem

The last contingency discussed, a theater battle supported by strategic strikes, does not fit neatly into either the strategic or theater warfare category. As such, it brings up two related problems that are the focus of this section. One is the problem of taking into account "off-design" contingencies in structuring our warning system. The other is the problem of warning of escalation once a war has already started.

There is controversy in the West over whether an attack that includes selective strategic strikes is consistent with Soviet doctrine, or even sensible.¹⁷ Reasonable arguments can be made on both sides. The problem would come were we to dismiss this possibility, not even considering its consequences in testing the effectiveness of our defense, its associated warning system, and hence our deterrent. In developing a defense and a warning system optimized against the presumed enemy strategy, we must be sure to loop back to check if we have left openings that might tempt the Soviets to go "off-doctrine" to exploit specific weaknesses in specific circumstances.

Off-design contingencies for which the defender was unprepared and which the warning systems missed form the core of the analyses in both *Protecting U.S. Power to Strike Back* and *Pearl Harbor*. *Protecting U.S. Power to Strike Back* considered the possibility of a relatively small Soviet nuclear strike designed to bypass our warning system and destroy our immediate nuclear combat capability. The way would then be clear for follow-on Soviet attacks on a broader set of targets, at which point warning would do us little good. *Pearl Harbor* discussed an actual off-design attack. In 1941 the Japanese combined a not-unexpected theater attack on Southeast Asia with a quite unexpected strategic strike on

the U.S. Pacific Fleet, thereby largely eliminating our capability to interfere with their theater campaign. America was surprised by a number of characteristics of the strike on Pearl Harbor, ranging from the boldness of Japan's grand strategy to the ability of Japanese torpedoes to function in the shallow waters of the harbor.¹⁸

The logic of off-design attacks is perhaps best illustrated by the Killian Committee excerpt quoted in part earlier. The full paragraph discusses the difficulty of gaining a timely U.S. decision for a total nuclear response to a Soviet total nuclear attack, given that the Soviets are likely to make indications of their attack ambiguous:

It is only wisdom on our part to believe that a clever enemy will discern the dilemma of the total decision. He can be expected to design any surprise attack to engender ambiguity in our early warning signals. He may discover and proceed to tantalize our indicator boards. He may disrupt our communications, even probe our radar nets, without making war. He may appear bellicose and then turn reasonable again and again. If he has his way, the total decision will be for our executives an hour of extreme agony.¹⁹

This is a two-edged statement. On the one hand, it makes the fairly obvious point that, where a U.S. total decision for nuclear retaliation is likely to mean a holocaust, a president will be very reluctant to make it if there is the slightest possibility of error in the assessment of the Soviet attack. Indeed, if he were convinced that a mass nuclear war was equivalent to global suicide, then no conceivable warning system could provide sufficient confidence to support such a decision.²⁰ The idea that a decision would or should be made to start what would certainly be a holocaust based on but a few minutes' consideration of the circumstances, evidence, and alternatives is a fundamental problem with deterrent schemes that depend on a strategy of launching missiles on warning.

An equally basic problem with launch-on-warning schemes is illustrated by the less-obvious side of the quote. Given that the results of a U.S. massive retaliation would be a holocaust, what does it mean to say "*If* [the enemy] has his way, the total decision will be for our executives an hour of extreme agony?" The answer involves the distinction between the difficulty of the decision and the horror of the circumstances in which the decision must be made, and is perhaps best illustrated in terms of a current joke:

The president is asleep at the White House when suddenly he is woken by an urgent knocking at his bedroom door. His military aide rushes

in, announcing that he has some very bad news and some good news. "The bad news, Mr. President, is that our warning systems have detected and confirmed that a massive Soviet nuclear missile attack is on its way, and you must order an immediate massive retaliation. On the other hand, sir, once you give the order, there is no reason for you not to go back to sleep."

As terrible as the situation of a massive Soviet nuclear attack would be, it poses a relatively easy decision *if* one could get absolutely certain warning. In the case of more selective Soviet nuclear attacks, however, where the worst may be yet to come, and hence uncertainties are high, the decision problem is much harder. In the midst of an ongoing but constrained war, there will be a continuing need for warning of vertical escalation (e.g., use of nuclear weapons in a war involving only conventional forces up to that point) or horizontal (i.e., geographical) escalation.

Three things will make this intrawar warning problem more difficult than warning of attacks in peacetime. First, the ongoing conflict will generate an extremely noisy environment against which to try to pick up warning indicators. Second, warning systems—both tactical warning systems such as ballistic missile warning radars and strategic warning systems such as reconnaissance satellites—probably will be diverted to operational intelligence collection to support the war effort (e.g., tracking enemy satellites or surveillance of targets for deep strikes), which may reduce their warning effectiveness. Third, in large part because these warning systems will have such operational military roles in the ongoing campaign in addition to their relatively benign warning roles, the enemy probably will try to destroy them, even if he did not have an immediate intention to escalate.

This last point is particularly important. While it is true that an enemy attack on our warning systems will give us warning, "warning of what" will be far from clear—hardly clear enough to support an immediate launch of our ICBMs, as some, such as Ashton Carter, have suggested.²¹

Conclusions

Probably the principal lesson from *Protecting U.S. Power to Strike Back* and *Pearl Harbor* is the importance of not separating information derived from our warning system from information about our plans for response to that warning, putting them into different compartments with tight access restrictions between the two. A warning system's effectiveness depends on the responses that it prompts, including their timeliness

and their costs. Moreover, our ongoing actions and force status will be key inputs to the intelligence process, since they affect enemy actions and our interpretation of the consequences of these actions, including understanding what weaknesses a selective surprise attack might try to exploit.

A closely related point is that, since the United States and its allies are defensive powers and are not likely to make a preemptive attack on the USSR in response to Soviet mobilization, there is only so much that intelligence can do to improve our warning system. An enemy may choose to mobilize for an attack while explicitly leaving open the decision actually to make that attack. Our response to such an enemy mobilization must be as repeatable and as sustainable as the threat that prompts it. Otherwise, no amount of intelligence can be relied upon to prevent surprise in the sense of being caught with our defenses unready. The enemy could simply outwait us and attack when we let our countermobilization fall off. To the contrary, we should regard a sustained response to such an enemy mobilization as a case of continuing deterrence rather than as an unnecessary response to a false alarm that a better warning system might have avoided.

Finally, we must focus not only on the problem of warning, but also on the question of "Warning of what?" Obviously, sustaining countermobilizations for as long as the adversary's mobilizations that prompted them requires some efficiency. For example, we will never be able to afford a full alert in response to every Soviet partial alert. We must also consider the alternative ways in which an enemy attack might be launched, rather than narrowing our attention to the question of whether he is preparing for one of a few canonical attacks.

A corollary to this need to consider off-design contingencies involves the relationship between warning and escalation. In particular, warning of, or even the occurrence of, a Soviet attack cannot be assumed to be warning of *the* Soviet attack. Just as deterrence does not stop when we begin a defensive countermobilization, neither should we abandon efforts to deter expansion of a war once combat has started in a limited way. In particular, we should prepare responses to intrawar warning of escalation as well as responses to peacetime warning of an attack. Moreover, in developing intrawar warning and response capabilities, we must consider the probability that our intelligence and warning systems will be subject to attack long before the enemy makes any decision to escalate. These systems need to be robust against such attacks—particularly in light of emerging Soviet conventional capabilities for deep strikes.

Notes

1. Roberta Wohlstetter, *Pearl Harbor: Warning and Decision* (Stanford, Calif.: Stanford University Press, 1962).
2. Albert Wohlstetter, Fred S. Hoffman, and Henry S. Rowen, *Protecting U.S. Power to Strike Back in the 1950s and 1960s*, RAND Report R-290 (Santa Monica, Calif.: RAND, August 1956).
3. Albert Wohlstetter, Fred S. Hoffman, Henry S. Rowen, and Robert Lutz, *Selection and Use of Strategic Air Bases*, RAND Report R-266 (Santa Monica, Calif.: RAND, April 1954).
4. This discussion does not mean that background intelligence has no warning value unless it leads to immediate action. To understand their warning situation, operational commanders may need to be aware of the context for their actions, as well as the immediate circumstances. See Roberta Wohlstetter, *Pearl Harbor*, pp. 38-40.
5. Technological Capabilities Panel of the Science Advisory Committee, *Meeting the Threat of Surprise Attack*, Report to the President (Washington: U.S. Office of Defense Mobilization, Feb. 14, 1955), vol. I, p. 15, and vol. II, p. 67. This report was declassified by the U.S. government on March 29, 1976.
6. The dilemma of how closely to hold sensitive data with fundamental security implications can appear in reverse when the intelligence community wishes to ensure that no action is taken on the basis of their information that might reveal their sources and methods. While this stricture may be appropriate in cases of psychological warning so leaders do not feel surprised, it fits ill with operational warning where warning is as warning does—particularly where the intelligence community may have to provide such information frequently for timely response to partial alarms.
A broader version of this dilemma appears in connection with the expanded U.S. use of compartmented weapons development programs (most notably, but not solely, various applications of stealth). On the one hand, protecting the superiority of these systems over those of the adversary may critically depend on their remaining covert. On the other hand, if ensuring that they remain covert requires that the number of people who know of them be small, it may limit the U.S. ability to exploit fully the capabilities of the systems or even to take them into account in broader planning.
7. Roberta Wohlstetter, *Pearl Harbor*, p. 306.
8. See Henry S. Rowen and Albert Wohlstetter, "Varying Response With Circumstance," in *Beyond Nuclear Deterrence: New Aims, New Arms*, ed. Johan J. Holst and Uwe Nehrlich (New York: Crane, Russak, 1977), pp. 225-38, which discusses the conceptually related point of matching our counterstrikes to the particular circumstances of an ongoing Soviet attack.
9. Maneuvering reentry vehicles (MaRVs) have a limited capability to alter their trajectories from their nominal ballistic courses. A more interesting exception that proves the rule about the relationship between tactical warning and attack assessment for ballistic missiles can be derived from Richard Garwin's

proposal for a launch-on-warning system for ICBMs. One "safety measure" he suggests to deal with the risk of false alarms in his scheme is to launch ICBMs on warning of attack, but enable or disable their nuclear warheads in flight. While some ICBMs would be wasted in the event of a false alarm, their warheads could be duded and the missiles would do only relatively confined damage when they crash landed on the opponent's territory. Of course, if the Soviets adopted a similar system and the United States mistakenly launched its missiles, they would see a large number of ICBMs coming at them and presumably also launch on warning. One could then imagine a frantic twenty minutes or so of negotiations in which the two sides decided it was all a terrible mistake and tried to send the orders to disable the in-flight missiles. Or was that not sending the orders to enable the in-flight missiles? See Richard L. Garwin, "Launch Under Attack to Redress Minuteman Vulnerability?" *International Security*, vol. 4, no. 3 (Winter 1979/80), pp. 125-27, 137, 139.

10. Though, as Albert Wohlstetter later pointed out, if the Soviets adopted the scheme he was advocating for the Strategic Air Command—to keep a substantial portion of bombers on permanent ground alert as a means of escaping on short warning—this would provide the Soviets with a capability for launching a bomber attack with little or no additional visible preparations. See Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, vol. 37, no. 2 (January 1959), p. 232. The Soviets seem, however, never to have adopted this kind of large-scale routine alert posture for their bombers, apparently planning for neither their own nor our "bolts from the blue."

11. Ibid. On current Soviet practice, see Craig Covault, "NORAD, Space Command Request System for Surveillance of Soviet Weapons," *Aviation Week & Space Technology*, vol. 126, no. 14 (April 6, 1987), p. 73.

12. Tom G. Belden, "Indications, Warning, and Crisis Operations," *International Security Studies Quarterly*, vol. 21, no. 1 (March 1979), pp. 185-86.

13. Technological Capabilities Panel, *Meeting the Threat of Surprise Attack*, vol. I, p. 29.

14. A selective strike whose primary purpose is to accomplish a specific military effect should be distinguished from a "shot across the bow" whose direct consequences are totally secondary to an intended signaling of resolve to escalate further.

15. From an interview given by Robert S. McNamara in 1962. Quoted in Albert Wohlstetter and Richard Brody, "Continuing Control as a Requirement for Deterring," in *Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington: Brookings Institution, 1987), p. 167.

16. See, for example, "Analysis of Effects of Limited Nuclear War, Testimony of James R. Schlesinger," in *Nuclear Strategy and National Security: Points of View*, ed. Robert J. Pranger and Roger P. Labrie (Washington: American Enterprise Institute, 1977), pp. 126-44.

17. See Richard Brody, *Strategic Defenses in NATO Strategy*, Adelphi Paper 225 (London: International Institute for Strategic Studies, Autumn 1987), pp. 34-35.

18. Roberta Wohlstetter, *Pearl Harbor*, pp. 369-70.
19. Technological Capabilities Panel, *Meeting the Threat of Surprise Attack*, vol. I, p. 29.
20. Wohlstetter and Brody, "Continuing Control As a Requirement for Deterring," pp. 185-86.
21. Ashton B. Carter, "Satellites and Anti-Satellites: The Limits of the Possible," *International Security*, vol. 10, no. 4 (Spring 1986), p. 79.

Why Does the Soviet Union Build Such Large Military Forces?

William E. Odom

Thinker and Teacher

I did not have the good fortune to study under Albert Wohlstetter, but I did feel his intellectual influence while I was a graduate student. His strategic basing study had become more widely known by the mid-1960s, and of course a number of his articles were classics, required reading. Through them I first discovered the power of Albert's mind.

My first meeting with Albert came in the White House mess during the Carter administration. He was lunching there with acquaintances who introduced us. Over the next decade I was to see Albert and Roberta frequently.

Albert compelled me to write a number of things, pieces I would never have done otherwise. He would not let me beg off, and usually I was later glad I had persevered. He also involved me in his many workshops and study efforts. On these occasions I witnessed not just the first-rate thinker, but also the remarkable teacher, at work. There is a difference, and much of Albert's work over the years hinges on it. Having the great insight, discovering the big truth, or getting the right answer to a major question is only the first step in a long process if that truth is to bear effectively on policy. Albert stands out as one of the few strategic thinkers in the postwar era who not only provided the key insights, but also had the teaching skill to spread that knowledge, to nurture it with students and colleagues, and finally to have it become incorporated into policy-making dialogue inside the government.

Witnessing Albert carry through this process a couple of times was a great learning experience for me, one as important as grasping some of the technical aspects of his analyses. I believe I am not alone in this regard. His many students, formal and informal, have expressed a similar sense of being held to the highest intellectual standards while dealing with all the parochial cross-pressures of the national security policy-making process.

* * *

Most historians have long realized that recorded history is the contemporary distortion of the past. They are reluctant to talk of the future because they know that their various and distorted lenses for explaining the past are unlikely to provide a clear view of what is yet to happen. Such caution is wise, but it does not absolve us of trying to understand both the past and the future, even if imperfectly. We have more than one view of history and, therefore, we have a choice of distortions. Which lens should we use to understand Soviet military behavior? Which one will give us less distortion in anticipating the future? If we can know why Soviet leaders built large military forces in the past, we may be able to make better guesses about their plans for future forces. We begin this chapter, therefore, with a short excursion in search of a better historical lens to investigate Soviet behavior. We then refocus that lens to see what it reveals about the past and present dynamics of Soviet military force-building developments.

Hypotheses About Why the Soviet Union Builds Large Forces

A satisfactory understanding of why states build the kinds of military forces they do is not easy to find, especially in the case of the Soviet Union. Three unsatisfactory explanations misinform much of the discussion in the West about Soviet military forces and doctrine. First, the action-reaction hypothesis imputes to the United States and its military force development the primary and most significant stimulus for the Soviet Union to build forces. The second rests on the view that Russian and Soviet history is a chronicle of invasions by foreign armies, leaving the Soviet leaders imbued with fears of a repetition of such invasions. No matter what the realities, this explanation holds that historically induced fears and suspicious continue to prompt the Soviet leadership to build much larger and more capable military forces than are needed objectively for defense of the USSR. The third explanation derives from a theory of behavior based on the official Soviet ideology, Marxism-Leninism. Committed to world revolution, the Communist party of the Soviet Union will spare no resource to succeed in this aim, it is asserted. Since ideology is the primary determinant, resource constraints play little or no role. The USSR will build whatever force is necessary, no matter what the cost.

A serious student of Soviet military affairs might react to these three hypotheses by calling them strawmen, not serious propositions.¹ That would be a mistake, however, because there is an element of

truth to all three that gets overlooked or underestimated. To be sure, there are also elements in all three that are not at all consistent with the evidence of Soviet military behavior.

The first hypothesis, action-reaction, has played a rather dramatic role in misinforming both the public and scholars about why the Soviets build forces. This was most vividly demonstrated by the remark of former Secretary of Defense Harold Brown, who said, "When we build, they build; when we don't build, they build." That the remark is accurate is its least importance. Of greater significance is that Secretary Brown felt compelled to instruct an audience that it should abandon the action-reaction assumption. Many students and analysts of defense issues had come to regard the hypothesis quite seriously.² They influenced the opinion makers of the West, who in turn convinced the public, at least large parts of it, that the "arms race" was both a reality and a major problem.

Albert Wohlstetter made one of his many penetrating interventions in the public dialogue by testing this hypothesis against the historical evidence. In two articles in 1974 and 1975, "Is there a Strategic Arms Race?" and "Optimal Ways to Confuse Ourselves," he demonstrated that the record of force building in the USSR and the United States does not support the popular assumptions of the arms race.³ If there is no strategic arms race, then the idea of action-reaction is difficult to accept. "We can have both action-inaction and inaction-reaction sequences," Wohlstetter argued, noting that "theories of the strategic weapons race . . . are blunt instruments in weapons debates. . . . When precise enough to be wrong, they are massively in error."⁴ He went on to show that U.S. intelligence estimates of Soviet strategic weapons "systematically underestimated the number of vehicles the Russians would deploy" after the mistaken estimate of a missile gap in the late 1950s.⁵ That overestimate seems to have induced an inexcusable bias thereafter toward underestimates. Convenient myths die hard, however, and the action-reaction theory of an arms race is still very much alive.

The second hypothesis, that the USSR builds large forces because of its historical fear of foreign invasion, has been scrupulously cultivated by Soviet officials and propagandists. They repeat, and many Westerners repeat after them, that the USSR has a long history of foreign invasions, particularly in the prerevolutionary period, that has imbued Russian culture with a penchant for security, great secrecy, and large military capabilities. To get on happily with Moscow, it is argued, the West must learn to accommodate a large Soviet advantage in military forces of all sorts.

Like the arms race theory, this interpretation of Russian history is a blunt instrument for analysis. Indeed, war has been an almost continual

part of Russian and Soviet history. If one goes back to the time of the Tartar Yoke, invasions were numerous, but they were not the only wars. The Russian historian Sergei Solovev counted 133 foreign invasions between 1228 and 1462, including forty-eight by the Tartars. Michael Florinsky adds ninety princely feuds, bringing the number of warlike disturbances to 223.⁶ As the Muscovite state took form, however, and the Mongols were expelled in the latter part of the fifteenth century, wars continued, but largely as a result of Russian expansion. Richard Pipes calculates that Moscow's hegemony grew at the rate of a yearly average of 35,000 square kilometers from the middle of the 1500s until the beginning of the reign of Peter the Great in the late 1600s. That is "... an area equivalent to modern Holland—every year for 150 consecutive years."⁷ Peter, of course, kept Russia at war for more than twenty years, expanding its territories from the Baltic to the Black Sea. Catherine the Great increased the empire's holdings in Poland and parts of modern day Moldavia and Romania in the latter part of the eighteenth century. The nineteenth century witnessed further territorial expansion by Russia, including Finland, parts of the Balkans, the Caucasus, and Central Asia. In the 1890s, the Imperial General Staff looked back over the results of Russia's military adventures and concluded that between 1700 and 1870 Russia had waged thirty-eight campaigns for a total of 106 years of war. Of those wars, the General Staff's report bragged, thirty-six had been offensive and only two were defensive. In World War I, the General Staff did not wait for an invasion, but took the offensive into Prussia. Thus, the record of the old regime is hardly one of uninterrupted invasions. Indeed there were invasions, but as the Imperial General Staff study makes clear, official perception of the record was not one of fear of invasion so much as pride about successful military expansion.⁸

What is the record of the Soviet period? The Civil War included interventions by the Western allies, but they proved feckless. Marshal Pilsudski took Polish forces deep into the Ukraine, but the Red Army threw them back. Large pieces of the empire managed to escape Bolshevik rule—the Baltic states, Poland, Romania, Finland, and Manchuria—but the Bolsheviks retained the large majority of the imperial territories. In 1939, Stalin took the opportunity offered by Hitler to regain most of the lost territory in Eastern Europe. Between 1939 and 1941, the USSR swallowed Latvia, Lithuania, Estonia, part of Finland, and part of Romania. In the Far East, the Red Army clashed with the Japanese and made temporary advances into Manchuria. Mongolia, of course, had been brought under Soviet hegemony in the 1920s. After the war, Soviet forces brought puppet regimes to most of Eastern Europe and a large part of Germany. The borders of the

Soviet Union were moved westward from Karelia to the Black Sea. In the Far East, the borders were moved to the advantage of the USSR at Japan's expense. For a time, Soviet forces occupied part of Iran, but they were withdrawn when the United States pressured Stalin to remove them. The colonization of lands bordering on the USSR continued even into the 1980s with the Soviet occupation of Afghanistan. Zbigniew Brzezinski reminds us that looking back today, "the Russian Empire has expanded now for 250 years at the rate of one Vermont per year."⁹

It is true that Russia and the USSR have been invaded, but that should not be surprising in light of the massive amount of territory both regimes have swallowed up over the centuries, including right up to the present time. There may, nevertheless, be a certain substance to the Soviet propaganda line that Russians have a deeply imbued sense of insecurity as a result of historical experience with wars. Having invaded their neighbors and occupied their lands, the Russians can justly fear that these occupied peoples still seek revenge and opportunities to win their freedom from the Soviet empire. The requisites of empire provide a strong stimulus for Soviet military force building. Important insights into Soviet military force development can indeed be gleaned from the history of Russian and Soviet offensive military actions in all three major contiguous theaters—Europe, East Asia, and Southwest Asia.¹⁰ But this aspect of the original hypothesis for explaining why the Soviets build military power is not normally what Westerners call to mind when they invoke this theory of Russian history. It is, however, the aspect for which we can find compelling empirical grounds.

The third hypothesis concerns the role of ideology as a stimulus for Soviet military policy: since the Communist party of the Soviet Union has seen itself at the head of a great struggle between socialism and capitalism in the world, a struggle in which contradictions are irreconcilable, the USSR has put the production and use of military power above all else. Moreover, peace depends on the destruction of capitalist societies. True, peaceful coexistence has been official Soviet policy since 1921, when Lenin conceived it, and it remains so today according to Gorbachev.¹¹ But peaceful coexistence is also defined as another form of the international class struggle. The source of war is, according to Soviet ideology, the contradiction between classes in the capitalist camp. Remove capitalism and the source of war is removed. Q.E.D.: true peace occurs only after the victory of socialism; "peace-loving forces" by definition seek the destruction of capitalist society. Or, as is taught in Soviet military schools:

Wars are a historically transient phenomenon. They are linked only with the period of existence of an exploitative society. Their basis is private

property and the division of society into classes. With the liquidation of the exploitation order and transition of all mankind to socialism and Communism, the causes of wars will be eliminated, military conflicts themselves will disappear.¹²

If indeed this proposition is fully operational in Soviet decision making, it explains Soviet behavior, although it might not satisfy critics who impute no real causal power to ideas but rather look for underlying objective causes more or less concealed from consciousness. How do we sort this out? What sense are we to make of it?

It is popular nowadays to dismiss ideology as a significant causal factor in Soviet behavior. It is not considered chic to be concerned with ideology because that may imply one is anticommunist. The basis for this fad is not academic analysis of new empirical evidence. Rather, it is sentiment reflecting Western domestic political moods. One only need recall the outcry against President Reagan for calling the Soviet Union an evil empire. This was considered by many as ideological, unfair, and unjustified, but would these critics want the president to call the Soviet Union a virtuous empire? That was the implication of their outcry. Furthermore, the downplaying of ideological and political factors also finds a place in the universities, where there is a tendency to avoid concluding that communism is inimical to individual freedoms and genuine reconciliation with Western democracies.¹³ One might dismiss all this as not very relevant to explaining why the USSR builds military forces unless one takes seriously the possibility that ideological factors may play a significant role.

It is possible to distort or overestimate the role of ideology. By relying solely on Soviet doctrine about the types and causes of war, one can fall into the intellectual trap of assuming that the USSR acts according to its ideological precepts without fail and always in the most effective fashion. At times Moscow has pursued its political aims in a dogmatic, ideological fashion that proved counterproductive. Lenin repeatedly lectured his colleagues about excessive scholasticism in the application of Marxism to the new regime's practical political, economic, and military problems. Today one occasionally finds a similar tendency among Western analysts who take the ideological dictates so literally that they do not consider the implications of resource constraints on Soviet military capabilities.

It is also possible to dismiss ideology as not very important by arguing that it reflects less about Marxism and more about Russian historical experience, habit, and behavior. In other words, Marxism-Leninism is not behind the quest for military power; the true cause is found deeply embedded in Russian history. Soviet ideology is merely

the latest rhetorical justification for behavior that has other causes. This is an important argument. Historical factors do count for much in explaining the sources of Soviet military behavior. It is a mistake, nonetheless, to dismiss ideology as a major explanation of the numbers and kinds of Soviet military forces. Marxism-Leninism makes some important contributions to the theory of war which we do well to understand.

Lenin found Clausewitz a congenial theorist on war. At key moments his language took on a Clausewitzian style. On the eve of the October revolution, for example, he is reported to have said, "To have an overwhelming superiority of forces at the decision point—this law of military success is also a law of political success."¹⁴ At another time he said, "the more deeply political a war, the more 'military' it seems; the less deeply political it is, the more 'political' it seems."¹⁵ His reading of Clausewitz was not, however, limited to eclectic borrowing of phraseology. Clausewitz's concept of friction in war, the problematic and unpredictable character of many little events obstructing the execution of a strategic plan, appealed to Lenin as equally true of politics, particularly the vicissitudes of class struggle and historical development. He also liked Clausewitz's view that the cabinet and the general staff were the places where rationality in the conduct of war is introduced. Lenin's central committee was essentially the brain of the Bolshevik party, designing the campaign plan and merging the political and military factors, just as Clausewitz insisted that the cabinet and general staff should do. Lenin, of course, could not accept Clausewitz's view of war as only a phenomenon between states. The nation, its interests, and its will were the resources with which Clausewitz's cabinet and general staff conducted war. Lenin's resources, as he saw them, were the economic interests and feelings of exploitation and injustice in the working class. Whereas Clausewitz conceived war as primarily an interstate phenomenon, Lenin conceived it as primarily an interclass phenomenon. This is not to say that Lenin rejected interstate warfare. Rather it is to say that he viewed interstate warfare as a form peculiar to the bourgeois historical epoch, a kind of war fought in the interests of the propertied classes at the expense of the working class. To his chagrin, World War I began as an interstate conflict. Lenin was horrified at the behavior of Europe's working class, which split along national lines in 1914 in fits of patriotic fever. Worker loyalty to nation proved much stronger than loyalty to class. Lenin wanted to see a transnational civil war in which the working class would act in solidarity to take power by destroying the nation-state system, first in Europe and eventually in the world.

Lenin's significant contribution is the redefinition of the category of belligerent from state to class. In practice, that meant transnational groups. But the failure of the revolution in Europe prevented the transnational victory that Lenin envisaged. The young Soviet state was thus in a difficult predicament. The Bolsheviks had seized power in a backward country, not where Marx anticipated a socialist revolution would occur. The end of the Civil War left the Bolsheviks with the choice of carrying the revolution into Western Europe on the bayonets of the Red Army or of consolidating the territory they had won.

Lenin chose the route of consolidation in his new policy, peaceful coexistence. It did not mean the end of war. It meant war of a different form. It meant political and military coalitions with national liberation movements in the non-European colonial regions, coalitions aimed at breaking the British, French, Italian, Portuguese, Dutch, and Belgian grips on their territories abroad. It meant maintaining effective party-to-party relations with the communist parties in the advanced industrial states of the West. It meant a general-staff role for the Third International (Comintern) in directing the transnational coalitions of forces in their struggle against imperialism and capitalism. But it also recognized the persistence of bourgeois states and the requirement to be prepared to deal with interstate warfare.

Marxism-Leninism cannot be dismissed either as having no influence on Soviet military policy or as merely new rhetoric for a traditional Russian imperial policy. The categories of thought in the official ideology encourage both party and military officials to assess the prospects for expanding Soviet influence in terms of class conflict, of local contradictions, and of the international correlation of forces. These concepts are not congruent with imperial Russian categories for military and foreign policy analysis. Soviet ideology also has the practical result of providing a design for a special clandestine kind of revolutionary organization within all nonsocialist states: communist parties. They have their public side, but even today they are organized and managed in the traditional Leninist fashion. Were they to give up this Leninist feature, they would simply be social democratic parties of the kind that have learned to participate in a nonrevolutionary way in almost all Western European parliamentary democracies. Communist parties work to penetrate and manipulate other organizations and draw disparate groups together in front organizations for purposes objectively in Moscow's interest.¹⁶ It is most unlikely that these political and organizational tools for political combat would have existed without Lenin's theoretical contributions. It is equally unlikely that a Western scholar, discussing the Soviet conception of regional security, would say the following if it were not for Lenin's ideological influence on the Russian view of war: "... Soviet policy

makers see no intrinsic merit in stability in the less developed world. To the contrary, they consider change and conflict to be unavoidable and, in general, desirable."¹⁷

While ideology does not account for all the characteristics of the Soviet military force posture, its categories, its logic, its identification of friend and foe, and its moral justification of warfare are critical for an understanding both of Soviet military policy and of how and where they expect to use military power. For example, to study Soviet military forces and doctrine only from the viewpoint of war as an interstate phenomenon (the traditional Euro-American viewpoint) and to ignore the interclass or transnational group alignment in a military conflict would be to fail to see the full scope of the battlefield and, of course, many of the forces that affect the battle's outcome.

In sum, there is something to all three hypotheses, action-reaction, Russian traditional fear of invasion and war, and communist ideology. The first, however, is probably the least powerful explanation. The second has cogency, but for reasons quite opposite from the Soviet official view of who invaded whom and who took whose lands. The third blends well with the second and, when used as a system of thought for political and military analysis, can provide a rationale for the dramatic scale and directions of Soviet force development.

The Pattern of Soviet Military Development

A recurring pattern is discernible over the seven decades of Soviet military activity. This pattern gives us a fairly strong clue to the future directions Soviet leaders desire for their military force development. These directions may or may not turn out to be the reality of future Soviet military power, but they are a shadowy idea of what the Soviet General Staff wants future Soviet forces to be. Let us sketch briefly the nature of the recurring pattern.

It begins with a recognition among the military and political leadership that in a relative sense, Soviet military capabilities are limited by a set of essentially three objective conditions. First, the manpower base has a low technical-cultural level when measured against the requirements of modern war. Second, the Soviet industrial base is not sufficiently developed to provide modern technology and weaponry, either qualitatively or quantitatively. Third, several new technologies are beginning to make themselves felt in the development of new weaponry. Having recognized these conditions, the question naturally follows, What is to be done about them?

The first step the Soviets generally take toward an answer is to try to define the nature of future wars in light of the new technologies.

Of course, the nature of future wars is not easy to explicate in an unambiguous fashion, and several analysts, all equally trained in the fundamentals of Marxism-Leninism, are likely to produce different definitions. Debate, therefore, characterizes the effort within key military and some party circles to reach a commonly accepted view of future war. The period of debate varies, but it leads to an official single vision that is set forth publicly as Soviet military doctrine. The basic Marxist-Leninist tenets concerning politics, class struggle, the two-camp struggle, and so forth are retained, but the new technologies become the factor of change, the basis for new assumptions and new requirements.

The new requirements are not limited to military issues. They normally turn out to affect every sphere of social, economic, and political life. As the official definition has it, "military doctrine has two tightly connected and mutually interactive sides: a social-political side and a military-technical side."¹⁸ The social-political side "encompasses all questions concerning methodology, economic and social bases, and the political goals of war. It is the defining side and the more stable." The other side, the military-technical, must accord with the political goals. It includes "creation of military structure, technical equipping of the armed forces, their training, and definition of forms and means of conducting operations and war as a whole."¹⁹

For Soviet military planners and thinkers the definition of future wars lies in the realm of military science. It is driven by the nature of technology and the proven and potential methods of applying that technology to warfare. The proven methods, of course, are learned from the study of military history, of practical experience. The potential methods are speculative hypotheses about future military combat.

Once the lid has been put on debate about future wars, or to put it another way, once military science has delivered its "objective" findings, the Soviet military can proceed to develop the social, economic, and military requirements in the context of an officially promulgated military doctrine. X

The sequence here is important. The intellectual process starts with ideological assumptions and propositions about historical process, class struggle, and so on. The basic stimulus seems to originate with the political preferences expressed in the official ideology. The next stimulus is not, as many believe, the size and nature of foreign armies in the possession of capitalist states. Rather, it is the nature of technology. "Cause" for Soviet weapons developments derives, therefore, from new technology before it does from "action" in the force structure of adversaries (as the action-reaction hypothesis wrongly assumes). Next in the sequence comes an assessment of the forces at the disposal of

capitalism and imperialism as well as the military, economic, and social resources at the disposal of socialism or the Soviet bloc.²⁰

Once this work is done, planners are ready to lay out the industrial, social, and manpower policies required to support the building of Soviet force structure. Until now, the rest of society has been forced to give priority to these requirements because winning the international class struggle, defending (i.e., expanding) socialism, and defeating imperialism (in order to achieve "objective" peace) have taken historical precedent over all other human needs such as consumer desires, personal rights and liberties, and the like. Again, this is not a trivial ideological point, but a major factor in understanding not only Soviet military policy but all Soviet domestic policy. The measure of economic success has not been social satisfaction of the population as a whole. It has been success in developing *military potential* (*voennyi potentsial*, a Russian term with a broad and uniquely Soviet connotation). As long as imperialism and capitalism survive, the potential for war exists and the necessity for priority in all policy to class struggle remained the cornerstone of policy, at least until very recently.

Since the Soviet predicament has repeatedly been one in which an adequate industrial and technical base either did not exist or was destroyed by war, in which the technical-cultural level of the manpower base was far too low to master modern military technology, and in which new generations of technology had altered radically the nature of future wars, not surprisingly military policy has had a dramatic impact on every other sector of society.

We see in this recurring sequence a pattern similar to earlier periods of Russian history. Alexander Gerschenkron has described a cycle of economic development seen in Peter the Great's time where military exigencies kicked off a series of policies for a spurt in economic growth, followed by technological development, educational development, and eventually popular exhaustion. The military impetus and the top-down drive for change required political rulers and economic managers to use repressive methods. Eventually stagnation and decline set in, but not until several decades of vigorous military action had expanded Russian territory and brought heavy social and economic burdens to the society.²¹ To be sure, Gerschenkron is describing a larger development than merely the rationale for military force building, although he gives that factor the key causal role in the whole process.

The process we are considering in the Soviet period is more narrowly focused on the military question, even if that question has seemed to drive policy in all other aspects of Soviet development. The stimulus for the process is political choice making by the political elite in both the Russian and Soviet periods; in the Soviet period, this choice making

is rationalized as scientific in the categories of Marxist-Leninist ideology. It is not the threat of foreign invasions. It is not an arms race initiated by adversaries.

In the Soviet period, the cycle is now in its third iteration. The first began in the aftermath of the Russian Civil War in the 1920s; it continued to the beginning of World War II. The second cycle began in the aftermath of World War II and lasted until sometime in the 1970s. The third began in the late 1970s, continues today, and probably will not run its course before the end of the century. I have identified these cycles—or revolutions—in Soviet military force development before, and will therefore sketch them here in a different and more elaborate way.²²

The First Revolution in Soviet Military Affairs

Immediately after the Russian Civil War, Lenin set the new regime on a course for consolidation. Radical policies such as war communism gave way to a limited market economy at home, and Trotsky's idea of permanent revolution by carrying the war into Western Europe was set aside in favor of peaceful coexistence and socialism in one country. In this environment, the commanders of the Red Army launched a debate about the role of this Bolshevik "army of a new type" and its structure. By the middle of the 1920s the debates about strategy and doctrine had subsided and official doctrine and policy were being promulgated. Much has been made of the debates of this period. Fedotoff White's *The Growth of the Red Army* remains a classic account and John Erickson's *The Soviet High Command* describes the events of the period in enormous detail. Malcolm Mackintosh and Raymond Garthoff have also produced succinct accounts of this period.²³ With the passage of time, however, we can reflect on the material in these works, add more, and discern a structure to the period that was not wholly evident three decades ago.

Much of the literature emphasizes the debate between the Red Army commanders on one side and some of the "military specialists" (former imperial Russian officers who joined the Red Army) on the other. Trotsky also took issue with what he believed was high-flown and pretentious military theorizing by the semiliterate new officer corps. Standing back from the debate, one sees a group of military leaders who had been through two wars (the World War and the Civil War) in which aviation, motor vehicles, and chemical weapons had been used for the first time in military operations. They also saw the West far ahead in the mastery and production of these new technologies for military use; saw themselves with a vast, illiterate military manpower

pool; and saw their economy in destitute conditions. Yet they were inspired by their own civil-war experience with swift and deep offensive operations that succeeded against the better-trained White Army and the Poles. They were convinced of the political superiority of their ideology and the prospects for world revolution, even though it was not imminent. As they thought through these realities and preferences, they understood that they must first build a modern industrial society, then a modern revolutionary army—or as it came to be justified in official language, “an army of a new type,” unlike armies of the nonsocialist states.

The key question was, of course, whether they would modernize society in order to build a modern army or would build an army only to defend modernization of the society. Inherent in the Leninist idea of a transnational revolution (i.e., Marx's concept of a working class revolution) is the notion that the revolution—a military operation in its final stage—takes priority over other preferences. This point was the subject of much controversy at the turn of the century in Russian Marxism. Lenin charged his fellow Marxists with the “heresy of economism” because they gave priority to wage gains for workers at the expense of the broader goal of violent revolutions and the other political aims of the movement. Frunze and his fellow Red commanders in the 1920s believed that the priority should remain on the revolution, not on society for society's sake. A socialist state is a besieged society while imperialism survives. Thus, the parameters for developing the economic and social policies were, in Frunze's view, the requirements for war. Trotsky, in his debate with the Red commanders argued that “The Army is a copy of society,” not vice versa.²⁴ Frunze insisted that “The military department is obligated . . . to influence the character and direction of work on economic institutions.”²⁵ Frunze was much closer to Lenin on this issue if one takes note of Lenin's consistent emphasis on the primacy of the political over the economic. That was the crux of the issue of “economism” two decades earlier and again in the spring of 1917, when not even Lenin's own party believed that a socialist revolution was possible in backward Russia. Lenin abruptly turned his party around when he arrived in Petrograd in April.

This point is key to understanding Soviet military and industrial policy. Military requirements come before all else. They reflect the objective power needed for the Soviet Union's political competition with the rest of the world. Satisfaction of consumer desires, public social satisfaction, these are not the primary goals of Soviet economic performance. Political-military power is the primary goal, and it should be the yardstick by which the Soviet economy is measured.

Frunze spelled out the approach to the problem of military affairs with three "moments," or questions to be answered. First, what is the nature of future wars? Second, what are the enemy's means? And third, what are one's own means?²⁶ The answer to the first question was not happy for the Soviet regime. In the view of the Red commanders the nature of future wars was so changed by aviation, motorization, and chemical weapons that the entire society would be involved. The distinction between front and rear would lose its previous clarity. Industrial cities would be bombed; mobile ground forces would strike hundreds of kilometers into the rear in a few days or weeks. From this image flowed Frunze's claim that the military must influence the structure and direction of the economy, the character of education, and the military training of the entire population.

In the short run, Frunze believed, the Red Army had to be reduced in size dramatically. Priority in resources should go to building an industrial base that could provide technology equal to that of the West. In other words, the Red Army leadership was quite willing to forego present military force structure in order to permit the economic development necessary for future military forces or more modern means. The Red Army accepted the militia system in which the army fell from several million to about 560,000 in only one or two years. It remained small until late in the 1930s. The emphasis remained on industrial development, on training of the officer corps, on designing new tanks, aircraft, and weapons, and on creating a literate manpower base. Emphasis was also placed on creating an economic surge capacity for wartime production.

It is not too much to argue that a major stimulus for the First Five-Year Plan and the end of the New Economic Policy in 1927 was the military requirement. While it is certainly not the traditional interpretation held in academic circles, it is consistent with the ideology, the arguments in the military debate, and many of the policy actions by the political leadership.²⁷ Trotsky lost out in the struggle for military policy and, although Frunze died under suspicious circumstances in 1925, his views were very close to those that Stalin found congenial.

Let us return to Frunze's three moments. The nature of future wars, the first moment, was defined in a fairly perspicacious fashion. The concepts of deep and swift ground operations reaching into the rear of the opponent, of bombing of cities and industry, of the primacy of the offensive form of war, of the need for massive industrial mobilization, of the requirement for a large literate manpower pool and mobilization system, and of war on a larger scale than in World War I—these characteristics proved highly descriptive of World War II.

In assessing the second moment, the enemy's means, while the official propaganda line pictured a threatening world around the Soviet Union, the leadership's actual view was clearly of a more benign world, a capitalist encirclement put off guard by its misunderstanding of peaceful coexistence. Dropping the force level to about 560,000 troops demonstrated confidence in the view that major war was not imminent. At the same time, foreign military technology was valued highly. The leadership was willing to take some unusual measures to acquire help in building its own aviation, motor, and chemical industries. The secret liaison between the Red Army and the *Reichswehr* of Germany was begun in 1923, with Trotsky keenly enthusiastic for it.²⁸ On the whole, it seems the Red Army got the better of this deal. While the *Reichswehr* received secret training advantages, the Red Army's tank program, aviation industry, and chemical industry trace their surge growth in this period to the German assistance.

In assessing the third moment, one's own means, Frunze and his colleagues were fairly candid about their weaknesses, although Trotsky thought they were living in a dream world in regard to many matters: offensive doctrine, a unique "proletarian military doctrine," and too little attention to traditional military details. Despite Soviet weaknesses, Frunze added a military component to Lenin's foreign policy of peaceful coexistence by including the military potential of the new regime's support to anticolonial activities. As he put it, "the sum of these two reasons—our economic and political growth on the one hand, and on the other, the movement of colonial peoples—creates the greatest fear among the ruling bourgeois groups."²⁹ For example, in a report on the December plenum of the Revolutionary Military Council of the USSR in 1924, he raised the matter of the political aspects of national army formations in some of the union republics. While ten divisions of Russians in a regular status would be preferable from a purely technical military viewpoint, five such division and five poorly trained national minority divisions have more potential for inspiring the anticolonial movement in Asia.³⁰ In judging Soviet military potential, Frunze was taking into account the strategic diversion that anticolonial military actions could create for European states with colonial holdings. War for Frunze, as it was for Lenin, was an interclass phenomenon, not only an interstate affair.

The process of Soviet military development in the 1920s and 1930s proceeded essentially along two lines that flowed from the kind of analysis Frunze spelled out. First, economic development and acquisition of new technology were given priority above all else. Education and related social policies also had the military rationale of providing a higher technical-cultural level in the manpower base, something the

Red commanders recognized was sorely needed. Second, the military establishment began to work out new tactical and operational doctrine in light of the new weapons technology.

While Trotsky had underestimated the importance of the coming dominance of the offensive over the defensive in land warfare, Frunze and his colleagues proved more prescient. They designed a new doctrine for deep battle (*glubokii boi*), envisioning operations reaching fifty to one hundred kilometers in a few days. These ideas were codified in the new field regulations of 1929 and revised in 1936. Tukhachevskii took a major role in this working out of doctrine, and he also inspired the Red Army to field the first parachute troops, a capability the Soviets revealed to Western observers in 1932.³¹

One might conclude from the early performance of the Red Army in World War II that all these efforts were in vain, but that would miss the mark by a considerable amount. The Soviet industrial base managed to survive with the help of American lend-lease, but the interwar organizational system should be given more than a little credit. The initial manpower callups did not all go smoothly, but the Red Army was able to continue to field division upon division, reaching a total of over 300. The big failure came in operations. Caught by surprise, the Red Army had to fall back, and even when it could stabilize a sector of the front it demonstrated little or none of the offensive plan that had characterized the debate in the 1920s over the importance of the offensive and the special Soviet advantage in this kind of warfare. The deep operation did not come until the Soviet strategic counteroffensive, and it may have been learned as much from the German offensive into the USSR as from the 1936 field regulations. In principle, however, the Red Army leadership had been right about the nature of future wars and what had to be done to prepare for them.

A case can be made that Stalin was more to blame than the Red commanders for the early defeats in the war. He only permitted significant production of military equipment and weapons to begin in the mid-1930s; he destroyed the most competent Red Army leaders in the great purges just before the war; and he rejected strategic warning of the German attack. In any case, by 1943 the Red Army was fighting very much along the lines that Frunze, Tukhachevskii, and others had conceived in the 1920s.

The record of Soviet military policy toward the Third World in the interwar period did not yield all that one might have expected from Frunze's image of the prospects for national liberation movements. True, the Red Army became deeply involved in helping the nationalist forces of the Kuomintang in China, but Chiang Kai-shek turned on

the communists in 1927 and purged them mercilessly. Nonetheless, the Chinese nationalist forces were of value to the Soviet Union as a strategic diversion to Japanese forces, and the Soviets continued to urge united-front policies at critical junctures until the Japanese attack on Pearl Harbor in 1941. Decolonialization, however, received little Soviet assistance elsewhere. Ironically, the great impetus for decolonializing the world would come from the United States in the aftermath of World War II.

The Second Revolution in Soviet Military Affairs

After World War II, Soviet military leaders found themselves in almost precisely the same predicament as they had been in 1921. Their economy was destroyed. Their manpower base was only slightly more literate than in the 1920s, and most officers had only the skimpiest education. On the technology front, there were dramatic new developments that promised an even greater revolution in military affairs than had been wrought in World War I. Nuclear weapons, of course, were the most dramatic in their implications. Rocketry did not show its full potential in the "buzz bomb," but rockets would soon reach intercontinental ranges, achieve remarkable accuracy, and propel man into space. Even less obvious in its initial appearance was the field of cybernetics and the ramifications of the computer revolution.

We do not have as great a window into the thinking of the top leaders about how to deal with these realities as we do into the views of the Red commanders in the 1920s. The outlines of this thinking have been inferred from open-source writings and a few declassified holdings of the U.S. intelligence community, but the definitive history of this period is yet to be written. Nonetheless, these dim outlines reveal the same cycle as in the 1920s. Manpower in the standing forces was cut sharply in the immediate postwar years. First priority was put on reconstruction of the economy. Stealing, borrowing, and buying Western technology proceeded across the board. Reparations and the looting of Germany supplied a massive infusion of technology and scientific personnel. A number of new military-technical academies were opened in the late 1940s.³² They marked the first steps of what would become a major upgrading of the education of Soviet officers, shifting from one or two years of precommissioning school to a five-year, comprehensive general and technical education program in commissioning schools.³³

Working out the implications for military doctrine did not come as quickly as it did in the 1920s. One reason was that the USSR did not obtain the technology of nuclear explosions until 1949, and it was

several years later before usable nuclear weapons and test experience provided the Soviet military with a sound basis for developing military employment concepts. When they did begin to work through the operational implications of nuclear weapons, the Soviet military leaders did not follow as carefully in the footsteps of Western strategists as most Western observers seemed to believe.³⁴ Rather, they pursued a course more like the one followed after the Civil War. The task was to define the nature of future wars, not to invent concepts like deterrence theory. They were interested in how best to use nuclear weapons if that awful event had to be met; they were interested in how to fight and prevail in a nuclear war. They never really surrendered Lenin's view of the primacy of the political over the technical or economic in revolution (i.e., in war).³⁵

In 1962 Soviet doctrine had solidified sufficiently for a public volume to appear, *Military Strategy*, edited by Marshal V. D. Sokolovskii.³⁶ It seemed to sum up Soviet speculation about nuclear and rocketry war, to state its nature and the implications for preparation of the Soviet rear, mobilization, the initial period of war, and the operational and tactical factors imposed on the battlefield.

Two rather dominating implications emerged in *Military Strategy*. First, the Soviets believed the initial period of war could be decisive. Large exchanges of nuclear strikes would likely shift the correlation of military forces dramatically in favor of one side or the other. How to fight that initial period was, therefore, critical, in the Soviet view. It meant that large standing military forces, both conventional and nuclear, would be required. There would be no time for mobilization and weapons production. The strategic balance would shift in a few days or weeks and even subsequent periods might have to be fought with forces in being. This was a major change from the prewar doctrine, which allowed for standing forces backed up by a system of mobilization of both manpower and industry. The peacetime weapons stocks would henceforth have to be enormous. While plans for mobilization of industry would be retained and even enhanced to cope with the possibilities of nuclear war, they could not be the basis for the entire force structure, especially in the initial period.

The second dominating theme in *Military Strategy* concerned military operations under nuclear conditions. To prevent giving the enemy highly concentrated formations at which to strike with nuclear weapons, combat units would have to be dispersed. Yet, to attack effectively, massing of forces would be essential. It was some time after 1962 before Western observers began to understand precisely how the Soviets intended to achieve these seemingly mutually exclusive conditions. The solution was quite pragmatic. Dispersion would be achieved by eche-

lonment: the spreading of forces rearward in echelons, thereby avoiding heavily concentrated formations. These forces had to consist of armor-protected vehicles—tanks, armored fighting vehicles, and self-propelled artillery—for two purposes: first, to give their crews protection against blast, heat, and radiation from nearby nuclear strikes; second, to provide mobility sufficient to advance at many tens of kilometers per day, thereby achieving concentrations of forces at the forward edge of the battle area, where they are in contact with enemy forces. As Soviet forces came forward they would pile up, creating a mass of force too close to the enemy defense to make nuclear strikes attractive to the defender. Where they succeeded in penetrating the defense, the next echelons would pour through for traditional deep battle operations, only at greater distances in the enemy rear, up to several hundred kilometers.³⁷

Other forces were designed around this basic theater campaign doctrine to attack the enemy's home territory, cities, and economy. The traditional objective of war, destruction of the enemy's forces, was expanded to include his economy as well. Both objectives would be pursued simultaneously.³⁸ Lacking the means for a large bomber force after World War II, Soviet planners chose to put most of the resources into intercontinental ballistic missiles (ICBMs). Submarine-launched ballistic missiles and a few aircraft were soon added to the land-based missile force. Strategic defense was largely passive in this period—civil defense and command post hardening—although large investments were begun in active air defense. Antiballistic missile defense was given priority in research and development. The navy continued its long-term buildup, first aimed at defending the maritime approaches to the USSR, later at a blue-water capability to attack U.S. ships in the major oceans, particularly in the Atlantic.

By the mid-1970s the Soviets had fielded a very large force to meet the dictates of this new doctrine. Looking back, one can realize that Sokolovskii's volume set forth the general requirements for Soviet force development. It did not announce the existence of a Soviet capability to implement the doctrine, but offered a blueprint. It provided the rationale or the "military-scientific" basis upon which Soviet plans for implementation of this doctrine would rest.

The same is true of Sokolovskii's treatment of Soviet policy in the Third World, but he was vaguer on the specifics than in the case of theater campaigns and strategic warfare. Although the concept of exploiting revolutionary forces in the nonindustrial world in support of the international class struggle was optimistically articulated in the 1920s, the results of the policy had little to show by the end of World War II. Socialism succeeded where the Red Army could march in,

primarily Eastern Europe. Political alliances with the national bourgeoisie had paid no dividends, and socialist forces proved too weak to succeed under Soviet tutelage when the policy was more radical.³⁹

Khrushchev, of course, returned to the more traditional Leninist approach to national liberation and other nonsocialist movements in the late-developing states of the world. Not surprisingly, therefore, Sokolovskii's volume treated the military component of Soviet third-world policy much more as Frunze had. Among the several changes in the second and third editions we find successively less timidity about assessing a role for the Soviet military in wars of national liberation. Not only does it characterize national liberation movements as progressive, but also promises to help them. "The Soviet Union fulfills its duty consistently and undeviatingly, helping people in their struggle with imperialism not only in ideological and political regards, but also materially."⁴⁰

The Soviets had considerable experience in assisting national liberation struggles by the mid-1960s. The Korean War in the early 1950s, the Suez War in 1956, the assistance to Indonesia from 1958 through 1965, the Congo in the early 1960s, Laos in 1960-1961, Algeria in 1963, and the Yemeni civil war via Egypt in 1962-1964 were the occasions of significant Soviet military involvement. These episodes did not, however, include direct Soviet military participation, only assistance in the form of materiel and advisors. The official doctrine, as articulated by Sokolovskii, reflected this distinction. Material assistance, yes; Soviet military forces, apparently no, if that can be inferred from silence. Soviet military reach into the Third World was greatly constrained by their lack of strategic airlift and sealift, lack of foreign basing, limited weapons production, and the small number of adequately trained advisors. Constraints in weapons and advisors were being overcome by the late 1950s, but strategic lift to far-flung client states and insurgent movements remained a major limitation throughout the 1950s and 1960s. At the same time, U.S. power to compete in third-world regions was too great for Moscow to challenge aggressively.

Sokolovskii's rhetoric was, therefore, in tune with slowly changing realities. The foreign policy commitment to anti-imperialist struggles required a military doctrinal component, but it could not include the direct employment of either Soviet forces or the forces of Soviet client states as Moscow's surrogates. By the time of Sokolovskii's third edition in 1968, however, the hint was strong that the old constraints would be broken. Talk of "military support" to peoples opposing imperialism was added to "material support." Whether that meant only weapons and advisors could have been debated in 1968, but in the next phase of Soviet military policy toward the Third World it would become

apparent that the language was intended to cover more than weapons and advisors.

The Contemporary Revolution in Soviet Military Affairs

The postwar cycle of Soviet military development came to an end sometime in the 1970s with the appearance of a new set of technologies. Microcircuitry, directed energy, and genetic engineering were beginning to have a major impact on the economies of the West. They were also beginning to affect the nature of military capabilities, not only weaponry but also command, control, and intelligence systems.

These emerging technologies and their impact on military affairs are fairly well known in the West, but it is worth making some elementary points to grasp the nature of the impact. Microcircuitry and directed energy in the form of lasers affect many things, but the most fundamental military change they bring concerns means of acquisition of targets and guidance for accuracy of munitions. Miniaturization of computers in semiconductors has allowed the construction of conventional warheads for rockets, artillery, and bombs that can identify a target and then move toward it with almost perfect accuracy. Laser guidance systems also improve accuracy. Improved accuracy, of course, also permits reduction of nuclear warhead yields or use of conventional warheads in place of nuclear. If one imagines a column of tanks several miles long, it is easy to see that these accurate conventional weapons could be more effective than nuclear weapons in attacking such formations. The same general conclusion may hold for a number of other target classes. Technology, therefore, is causing some fundamental rethinking of the use of nuclear weapons.⁴¹

The implications for intelligence or reconnaissance are equally great. Changes in both communications and technologies for acquiring information about the locations and activities of enemy forces permit the acquisition of targets at virtually unlimited ranges. Not only are weapons becoming more accurate; targets for them can be found at great ranges.

These two changes, improved accuracy and better tactical intelligence, cannot be fully exploited without changes in command and control designed to take advantage of them. Computers and new communications technology create many new possibilities for organization and doctrine to employ the new weapons systems. Thus, the impetus for review and change is great under the impact of new weapons deriving from microcircuitry and directed energy systems.

Genetic engineering is more ambiguous in its potential impact on military affairs. It might help military medicine and it might change

biological warfare weapons. Mycotoxins and "yellow rain," reportedly a Soviet-supplied substance used against villages in Laos, are examples pointing to the potential of genetic engineering. The Soviet Academy of Sciences has a large program in genetic engineering led by Yuri A. Ovchinnikov.⁴² It is too early to do more than speculate that there will be a military impact. How great or significant is far from clear; it could prove to be trivial, but Soviet planners are not ignoring the possibilities.

As one would anticipate from this appearance of new technologies with military potential, Soviet military planners and strategists are once again rethinking the nature of future wars. They are considering longer conventional phases of conflict before the need to resort to nuclear weapons. Marshal Ogarkov speculated that global war is conceivable in which nuclear weapons are not used because of the destructiveness and effectiveness of conventional weapons incorporating new technology.⁴³ The difference between this third cycle in Soviet military force development and the earlier cycles is the lack of clarity about the nature of future wars in present day Soviet writings. The inchoate Soviet image was vaguely discernible in the late 1970s and it gained sharpness in the 1980s, but no single comprehensive synthesis of Soviet military thought on the topic—a sequel to Sokolovskii's volume—has been published.

The strong impression gained from the available literature is that the revolution in military affairs spelled out by Soviet authorities in the 1950s and summed up in Marshal Sokolovskii's volume is being rolled back in some respects. Colonel General M. A. Gareev, chief of the Military Science Directorate of the General Staff, which is an authoritative post for expressing views on such matters, recently offered revisions of Sokolovskii's volume. The thrust of his complaint is that Sokolovskii and his collective of authors made too sharp a break with traditional principles of military operations:

Thus, in this book [Sokolovskii's] it is said that a whole series of known principles, norms, and rules, which previously were considered guiding for military strategy, are subject now to fundamental review or to have lost their significance entirely. In this regard, the authors included the principles of the concentration of forces and means on the decisive direction, economy of forces, and local victory [*chastnaya pobeda*]. They assert that "in large degree strategic deployment, strategic offense and strategic defense, strategic maneuver, and others . . . have also lost their significance . . . as understandings of the theory of strategy."⁴⁴

As a preface to his review of these principles, Gareev sounded a theme that Ogarkov also voiced. A future war, in the view of the

Sokolovskii authors, would "in all circumstances be conducted with the use of nuclear weapons, and they viewed military actions with the use of only conventional weapons as a brief episode at the beginning of a war. However, the present accumulation of rocket nuclear weapons has reached such levels that the use of this weaponry in war can subject both sides to catastrophic results."⁴⁵ Gareev cites the modernization of NATO forces with new, highly accurate conventional weapons as evidence that Western military leaders now also believe that relatively long periods of nonnuclear war are possible, even likely. But he reminds his readers that "the possibility is not to be excluded that nuclear war may be unleashed by the imperialists."⁴⁶ This is, indeed, a significant revision for the Soviet side. Some in the West might interpret this formulation as acceptance of mutual assured destruction. While that inference cannot be dismissed lightly, the extensive Soviet attention to fighting under all conditions, nonnuclear as well as nuclear, indicates something distinctly different from, even if overlapping with, that notion.

Gareev went on to comment on the principles in question from Sokolovskii, as follows.

Concentration of Forces and Means of Destruction on the Decisive Direction. Gareev grants this principle continued validity, but with some modification. "The principle remains," but it should be applied more to "means of destruction" than to "forces." New conventional means increase the importance of maintaining strategic reserves in war. "However, the questions of dispersal of ground forces and the fleet, how to defend them . . . may not be answered by former solutions but must be achieved by taking account of new demands."⁴⁷ (A hint of new efforts in strategic defense?)

Economy of Forces. Because the length of the war will be difficult to estimate when it involves coalitions fighting coalitions, "it is necessary to be prepared for a lengthy, stubborn, and terrible armed struggle."⁴⁸ Thus, the Sokolovskii emphasis on using almost all extant forces in the early period of a war is to be relaxed somewhat. If this principle is applied to nuclear forces, it means holding larger reserves and using fewer weapons in initial strikes.

Local Victory. This principle remains valid because success in future war with strategic strikes will depend on success also at the operational and tactical levels of combat. Unlike Sokolovskii, Gareev apparently sees the large nuclear exchange as less decisive for the war's final outcome. Success in one theater will not necessarily be negated by homeland-to-homeland nuclear exchanges.

Strategic Defense and Strategic Offense. These principles retain their significance even in light of the new conventional weaponry. Precisely where the line between "strategic" at the theater level and "strategic"

at the global level lies is not clear in Gareev's text. Again, one could read this as including strategic defense of the homeland against nuclear attack. Moreover, the context encourages such as interpretation.

Strategic Deployment. This principle concerns mobilization and positioning of forces for war. Sokolovskii insisted that such increases in readiness could be achieved well in advance of the opening of hostilities. Gareev argues that, in light of imperialist preparations for surprise attacks without full mobilization of their own forces, there may be little or no time for advanced preparation, thus placing a heavy burden of combat readiness on Soviet forces in periods of peace. He also notes that political factors could prevent full strategic deployment before a war. Furthermore, this reality means that Soviet war planning for strategic deployment cannot rely only on the variant of war most advantageous for the Soviet Union. It must take into account several war variants, as well as allowing for rapid changes in deployment in light of unexpected scenarios in the opening phases of combat.⁴⁹

With these modifications in their image of future wars and their principles of strategy, the next task for Soviet planners is to work out strategic, operational, and tactical art in the context of the revised doctrine. Marshal Ogarkov launched that process during his tenure as chief of the General Staff. It included large changes in command and control, a higher tempo for the theater offensive, and much deeper operations much earlier than envisioned in the 1950s and 1960s. There has been a tendency among some Western analysts to see these changes as not new. Deep battle, they rightly insist, was conceived in the 1920s and 1930s.⁵⁰ But the scale and the method of using new weapons technology are indeed different. Ogarkov's idea of the theater strategic operation has much in common with the traditional Soviet emphasis on the offensive, but it also has much that is changed. Multifront operations on a frontage of over 500 kilometers aimed at moving 1200 kilometers within a month is a breathtaking concept when compared to the fifty to one hundred kilometer fronts envisioned earlier.⁵¹ The concepts of a long war, of possibly no use of nuclear weapons, of strategic defense, of coordinating offensive naval operations with theater campaigns—these are indications of doctrinal concepts and concomitant force-building goals that exceed anything we have imagined about Soviet military capabilities in the past.

Soviet military doctrine for the international class struggle in the Third World moved more or less in step with changes in doctrine for large-scale wars, but in the latest period some aspects of it are out of step with Ogarkov's revolution. This should not be surprising because new technologies have less impact on projection of Soviet power into the Third World than do political and economic factors. Two changes

seem to have occurred, although they are not as clear in the open literature or as explicit as doctrine for large-scale warfare directly involving Soviet and Western armed forces. One precedes the Ogarkov revolution and one is contemporaneous with it.

The first change came in the late 1960s. Brezhnev greatly expanded Soviet arms transfers, delivering roughly \$6.5 billion worth of arms to old clients and to seven new ones between 1965 and 1972.⁵² Supplies to Vietnam and the rearming of Egypt after the Six Day War of 1967 are indicative of the much bolder Soviet use of military instrumentalities in the Third World. The October War of 1973 brought yet another change: Soviet direct supply during hostilities and extensive participation by Soviet military personnel in many operational roles during the fighting. Moreover, this event destroyed the illusions held by many in the West that détente between the United States and the USSR excluded competition in the Third World. That disillusionment was to be reinforced with the fall of South Vietnam to the Soviet-backed North Vietnamese army in 1975.

This new line of Soviet participation evolved in 1975 to include the movement of Cuban combat troops by Soviet lift to Angola, a precedent that greatly disturbed leaders in Europe, as well as in the United States. It was to be repeated in 1977–1978 in Ethiopia. The culmination of this trend came in late 1979 when Soviet troops invaded Afghanistan.

The second change in Soviet third-world policy is difficult to follow, precisely because it is meant to remove the visibility of the Soviet hand in national liberation struggles and other insurgencies. In Vietnam, the Middle East, Africa, and Cuba, the Soviet Union clearly supplied their clients directly with military weapons and equipment. Without having obvious Soviet support, however, a number of other struggles, civil wars, insurgencies, and terrorist movements have shown remarkable vitality since the late 1970s, particularly in Central and South America, in the Philippines, and, in the case of terrorist groups, even in the West. The Soviet connection to these movements is difficult to document, but occasionally the veneer of comfortable illusion about the connection is stripped away. That happened when the United States invaded Grenada.⁵³ In Central America the Soviet connection to the Sandinistas was far from obvious in 1978 and 1979. The same is true of the insurgencies in El Salvador, Guatemala, and Honduras. Curiously, however, an umbrella organization like the FSLN has been imposed from without on the insurgent groups in all three countries. Attempts to achieve the same thing in Columbia have failed. The M-19 terrorists depend heavily on the Soviet-Cuban connection, but they have not allowed the umbrella structure to take them over. The New People's Army in the Philippines looks remarkably similar to the organizational

umbrellas in Central America. It is the first organization in Philippine history to unite guerrilla activity throughout the whole of the Philippine Islands. Insurgency is long standing on the islands, but it has never been coordinated by one command structure.

Materiel supply for these movements is provided largely from non-Soviet sources. International front organizations help, but most of the supply comes from robberies and banditry within the country of the struggle. For example, many of the early arms supplied to El Salvador seem to have been purchased in the United States with hard currency that was acquired from fund-raising in the West and robberies in Central America. More recently the Cuban-Nicaraguan connection has grown in importance for direct supply of weapons, since the insurgency was not entirely able to pay its own way.

The doctrinal writings for these changes are not as readily available as those on conventional and nuclear warfare. The signs, however, are to be found here and there. Kaplan traces them in the works of Marshal Grechko, General Yepishev, Admiral Gorshkov, and Colonel Kulish.⁵⁴ Not only do they expand on Sokolovskii's theme of military support in all its ambiguity, but they talk of the external function of the Soviet armed forces. Yepishev and Grechko were clear on that point in 1972 and 1973. The changed correlation of military forces between the superpowers, as embodied in the arms control agreements between them in 1972-1974, became the reference point for this new interpretation of the requirements of Soviet military science and military forces. The restraining effect of U.S. power in the Third World, which induced great moderation on the part of Moscow in the 1950s and 1960s, had been considerably reduced, in the Soviet view. Those laconic doctrinal pronouncements of the early 1970s foreshadowed the dramatic surge of Soviet military activity in the Third World that has continued until recently. While the Western literature on the subject has grown, we still have only a vague understanding of the military component of Soviet support to national liberation movements. That, in turn, leaves the more extensive attention to economic and political dimensions considerably distorted.⁵⁵

To generalize, we may say that large Soviet direct transfers of arms to insurgent movements have declined in favor of massive expansion of sales to ruling governments for hard currency. At the same time, insurgencies and other national liberation movements are not provided with direct supplies of weapons by the Soviets so much as encouraged, aided, or forced to acquire their weapons from indigenous or other non-Soviet sources through theft, robbery, and direct purchase. Moreover, the scope of these conflicts has been expanded to include Western industrial states as sources of both material and political support.

Transnational groups, coalitions of groups, and linkages make this possible, giving the conflicts new and complex dimensions.

Conclusions

These recent Soviet military developments follow the traditional cycle spelled out by Frunze and carried out in the interwar and postwar periods. First, military theorists identify the set of new technologies that are influencing warfare; next, they define the nature of future wars; then they assess the adversaries' means and determine their own requirements for doctrine and forces, as well as the implications for the state's economic and social policies. The Soviet General Staff is well into the third such cycle.

What are we to conclude from all this? A number of estimates and predictions are possible, and observers will disagree on many of them. Here let us offer a few of the more obvious and compelling conclusions.

First, there is a continuity in Soviet military policy that seems to be sustained today with as much momentum as its overly optimistic originators, the Red commanders of the Civil War, imparted to it in the 1920s. Behind its momentum lie many impulses, some historical, some ideological, and some based on perceptions of Western military developments. Why the Soviets build military forces on such a large scale is not easy to answer, but ideologically based, top-level political choices clearly are the nexus for most of the impetus.

Second, the latest cycle is propelled by a strong desire or determination to keep warfare, as an instrument of policy, subordinate to political choice and control, nuclear weapons notwithstanding. The issues that have galvanized so much of Albert Wohlstetter's intellectual energies, how to avoid losing control of policy to technology during warfare and how to avoid the intellectual and moral traps that accompany concepts like mutual assured destruction, are central in Soviet military thought. Yet Soviet theorists do not take nuclear weapons flippantly or regard nuclear warfighting as desirable. In this most recent revision of Soviet doctrine there is explicit recognition of the perils that such weapons bring as well as a search for objective ways to manage to avoid their use. All the same, the Soviet approach is coldly logical in facing the issue of the use of nuclear weapons rather than seeking escape through doctrinal sophistry.

Third, the means to conduct the international class struggle in the Third World and to cause it to affect the industrial states of the West remain abundant in the Soviet Union. Although the pattern of less-direct material support to insurgencies puts less of a burden directly on the Soviet Union, the stocks of weapons for that kind of conflict

are enormous. So is the number of military advisors and regional specialists who speak local languages. At the same time, Soviet client states in the Third World, as well as many nonaligned states, buy Soviet weapons, paying for them by barter and hard currencies. In fact, arms transfer to the Third World has become one of the strongest Soviet industrial export sectors. The expansion of Soviet maritime and aviation lift capabilities promises to increase the reach and capacity of Moscow to deliver these military resources more rapidly to remote parts of the globe.

In this connection, the Leninist concept of war as an interclass phenomenon is worth keeping in mind if we are to appreciate the full scope of the arena of conflict as the Soviets see it. The failure of Soviet policy toward national liberation movements between the two world wars did not mean abandonment of their efforts in the developing regions. On the contrary, the post-World War II period has witnessed a resurgence of effort there, matched by growing resources committed to the struggle and refinements and alterations of tactics and strategy.

Fourth, in resources for major wars, the outlook is less rosy for the Soviet Union. The goals they set for force development and capabilities have had consequences for the Soviet economy and manpower base that are staggering. Gareev hints at this in his historical review of deep-battle doctrine in the 1930s when he admits that some military leaders questioned the use of this doctrine because the material means were not and would not likely be available to the Red Army. That, he admitted, might be true, but it was no reason for Soviet military science and art to ignore the theoretical and doctrinal implications of contemporary technological possibilities. In other words, Soviet goals as dictated by doctrine were ahead of Soviet means.⁵⁶ The same predicament besets the Soviet military today. Yet the shortfalls of today, when viewed against those of the 1920s and the experiences of World War II, may not appear as demoralizing as they did in earlier decades. Nonetheless, one must retain grave doubts about how soon today's shortfalls can be overcome.

Comprehending the causal linkage between Soviet economic and social policies on the one hand and military policy on the other is not easy. The present circumstances, however, encourage the speculation that Gorbachev's *perestroika*, that is, restructuring of party, economy, and society, was inspired in no small part by his perception of the demands that contemporary Soviet military doctrine and force development goals place on the whole of the state. The military stimulus for social and economic change has always been strong in Russian and Soviet history. Peter, Catherine, and Alexander II certainly took it as a major impetus for development of the society and economy. Lenin

and Stalin followed the same path, but with perhaps greater energy. Khrushchev may have been less enthusiastic, but Brezhnev certainly gave it high priority. Conditions today do not permit a continuation of Brezhnev's policy. The means are not at Gorbachev's disposal to keep up that pace unless he can build a modern technology base and provide a better-educated manpower base to support the newly determined military requirements.

We are now seeing a scaling back in some kinds of forces and reductions in force levels, probably in order to accumulate resources for the new requirements of the economy and the technology base. Changes and variations are most likely to be found in the shifting of relative priorities for short periods. And, of course, the Soviet demand for economic interaction with the West as a source of capital and technology is likely to persist.

This judgment should be accepted with caution. The political turmoil now evident under Gorbachev could deliver surprises. It is doubtful if the Politburo at present shares a single view on how to confront the tasks in military affairs. It could choose to persevere on the present military modernization course and fail. Or it could choose to relax the schedule. Or it might decide to revise the revisions seen most lately in Soviet doctrine so that the requirements are more in line with the means. There is no precedent for this third option; in fact, General Gareev condemns it as wholly un-Marxist-Leninist. We cannot, therefore, take comfort in its prospects. Furthermore, it would imply rather fundamental policy revisions, some as great as abandonment of the traditional content of the idea of peaceful coexistence as another form of the international class struggle.

Whatever the direction chosen, we will understand it better if we avoid the popular answers to the question of why the Soviet Union builds such large and modern military forces at the cost of such great sacrifices by the rest of Soviet society. Action-reaction, fear of foreign invasions, and ideology are misleading explanations as popularly understood. If one takes seriously Soviet concepts of military science, military art, and military doctrine, it is possible to empathize with Soviet military leaders, to view the past and the future more nearly as they do. From that viewpoint, the causes and rationale for Soviet military force structure look quite different from those assumed in popular Western explanations, but they are more compatible with the evidence of past and present Soviet behavior. Although they do not give us certainty about future Soviet military developments, they will reduce our surprise about these developments, and more often than not we will succeed in anticipating major Soviet directions.

Notes

1. There are several sophisticated and cogent explanations of the causes of the Soviet propensity to build large military forces. See, for example: Richard Pipes, *Survival is Not Enough* (New York: Simon and Schuster, 1984); Zbigniew Brzezinski, *Game Plan: How to Conduct the U.S.-Soviet Contest* (Boston: Atlantic Monthly Press, 1986); Nathan Leites, *Soviet Style in War* (New York: Crane, Russak, 1982); Colin S. Gray, *Nuclear Strategy and National Style* (Lanham, Md.: Hamilton Press, 1986).

2. See Jerome H. Kahan, *Security in the Nuclear Age* (Washington: Brookings Institution, 1976), for a volume that advocated basing U.S. strategic arms policy on this explanation of Soviet behavior. Also see John Newhouse, *Cold Dawn* (New York: Holt, Rinehart, and Winston, 1973), for a range of conventional wisdom in this vein.

3. Albert Wohlstetter, "Is there a Strategic Arms Race?" *Foreign Policy*, No. 15 (Summer 1974) pp. 3-20, and "Optimal Ways to Confuse Ourselves," *Foreign Policy*, No. 20 (Fall 1975), pp. 170-98.

4. Wohlstetter, "Is there a Strategic Arms Race?" pp. 10, 5.

5. *Ibid.*, p. 5.

6. M. T. Florinsky, *Russia: A History and an Interpretation*, vol. 1 (New York: MacMillan, 1961), p. 79. I have used Florinsky's account of Solov'ev's data.

7. Richard Pipes, *Russia Under the Old Regime* (New York: Charles Scribner's Sons, 1974), p. 83.

8. N. N. Sukhotin, *Voina v istorii russkogo mira* (St. Petersburg: 1898), pp. 13-14. This source and citation are taken from Pipes, *Survival is Not Enough*, pp. 38, 286. I am grateful to Professor Pipes for pointing out this source to me.

9. Zbigniew Brzezinski, "National Strategy and Arms Control," *The Washington Quarterly*, vol. 10, no. 1 (Winter 1987), p. 6.

10. See Brzezinski, *Game Plan*, pp. 31-75.

11. Mikhail Gorbachev, *Political Report of the CPSU Central Committee to the 27th Party Congress* (Moscow: Novosti Press Agency, 1986), p. 15.

12. *Filosofskoe nasledie V. I. Lenina i problemy sovremennoi voiny*, ed. A. S. Milovidov and V. G. Kozlov (Moscow: Voenizdat, 1972), p. 20.

13. For an interesting example of the form this kind of activity can take in academic circles, see Robert Thurston, "Fear and Belief in the USSR's 'Great Terror': Response to Arrest, 1935-1939," *Slavic Review*, vol. 45, no. 2 (Summer 1986), pp. 213-34, and Robert Conquest's comment, "What is Terror?" pp. 235-37. Thurston implies rather strongly that the Great Terror really was not all that bad because most people were not afraid.

14. Quoted from Melgunov by Donald Grigor Suny, "Toward a Social History of the October Revolution," *The American Historical Review*, vol. 88, no. 1 (February 1983), pp. 31-52.

15. *Leninski Sbornik*, 12, p. 397.

16. See Philip Selznick, *The Organizational Weapon* (Glencoe, Ill.: Free Press, 1960), for the classic study of Bolshevik organizational theory and technique.

17. S. Neil MacFarlane, "The Soviet Conception of Regional Security," *World Politics*, vol. 37, no. 3 (April 1984), p. 299.

18. A. Belyaev, "Voenno-teoreticheskoe nasledie M. V. Frunze," *Red Star*, November 4, 1984.

19. Ibid.

20. See V. Reznichenko, "Doctrine for the Defense of Socialism," *Red Star*, November 29, 1984, for this line of reasoning. Also, for a textbook used in Soviet military academies that makes the same case, see *Nauchnyi kommunizm*, ed. E. F. Sulimov and V. A. Karamyshev (Moscow: Voenizdat, 1973), pp. 1842-83.

21. Alexander Gerschenkron, *Europe in the Russian Mirror* (Cambridge: Cambridge University Press, 1970), pp. 94-118.

22. See William E. Odom, "Trends in the Balance of Military Power Between East and West," in *The Conduct of East-West Relations in the 1980s*, Part III, Adelphi Paper no. 191 (London: International Institute for Strategic Studies, 1984), pp. 14-25, and William E. Odom, "Soviet Force Posture," *Problems of Communism*, vol. 34 (July-August 1985), pp. 1-14.

23. Dmitri Fedotoff White, *The Growth of the Red Army* (Princeton: Princeton University Press, 1944); John Erickson, *The Soviet High Command* (London: MacMillan, 1962); J. M. Mackintosh, "The Development of Soviet Military Doctrine Since 1918," in *The Theory and Practice of War*, ed. Michael Howard (Bloomington: University of Indiana Press, 1965); and Raymond L. Garthoff, *Soviet Military Doctrine* (Glencoe, Ill.: Free Press, 1953).

24. L. D. Trotsky, *Kak vooruzhilas' revoliutiia*, vol. 3, bk. 2, p. xi.

25. M. V. Frunze, *Izbrannye proizvedeniia* (Moscow: Voenizdat, 1934, 1950), p. 198.

26. Ibid., p. 22.

27. There is rich literature on the history of Soviet economic development. Among the older and still important works are Maurice Dobb, *Soviet Economic Development Since 1917* (New York: International Publishers, 1948); *Soviet Economic Growth*, ed. Abram Bergson (Evanston, Ill.: Row, Peterson, 1953); Harry Schwartz, *Russia's Soviet Economy* (Englewood Cliffs, N.J.: Prentice-Hall, 1954); Alexander Erlich, *The Soviet Industrialization Debate, 1924-1928* (Cambridge: Harvard University Press, 1960); Alec Nove, *The Soviet Economy: An Introduction* (New York: Praeger, 1966); and P. J. D. Wiles, *The Political Economy of Communism* (Oxford: Basil Blackwell, 1964). For a more recent review, see Raymond Hutchings, *Soviet Economic Development* (New York: New York University Press, 1983). Alexander Gerschenkron, *Europe in the Russian Mirror*, is exceptional for placing considerable emphasis on the military stimulus in Russian economic development. Continuity in the Soviet period should not be surprising, although most of the literature treats it as a minor factor, certainly not as being central in the debates or policy decisions of the 1920s, 1930s, 1950s, or even the 1960s and 1970s.

28. Hans Gatzke, "Russo-German Military Collaboration During the Weimar Republic," *American Historical Review*, vol. 63, no. 3 (1958), pp. 565-97.

29. Frunze, *Izbrannye proizvedeniia*, p. 356.

30. M. V. Frunze, "Itogi dekabra skogo plenuma revvoensovet SSSR," *Voina i revoliutsiia*, no. 10 (October 1926), p. 103.
31. See David Glantz, "Soviet Operational Formation for Battle: A Perspective," *Military Review*, vol. 43 (February 1983), pp. 2-12, for an account of the development of the deep battle concept.
32. See *50 let vooruzhennykh sil SSSR* (Moscow: Voenizdat, 1968), p. 489, for details on these academies.
33. William E. Odom, "The Militarization of Soviet Society," *Problems of Communism*, vol. 25 (September-October 1976), pp. 36-39.
34. See William E. Odom, "The Soviet Approach to Nuclear Weapons: A Historical Review," *The Annals of the American Academy of Political and Social Science*, vol. 469 (September 1983), pp. 117-35, and Joseph D. Douglass, Jr., and Amoretta M. Hoeber, *Soviet Strategy for Nuclear War* (Stanford, Calif.: Hoover Institution Press, 1979).
35. A selection of original Soviet writings on these points is available in *The Soviet Art of War*, ed. William F. Scott and Harriet Fast Scott (Boulder, Colo.: Westview Press, 1982). For a contemporary interpretation, see Raymond L. Garthoff, *Soviet Strategy in the Nuclear Age* (New York: Praeger, 1958).
36. V. D. Sokolovskii, *Voennyi strategii* (Moscow: Voenizdat, 1962).
37. For a recent analysis, see John Erickson, Lynn Hansen, and William Schneider, *Soviet Ground Forces: An Assessment* (Boulder, Colo.: Westview Press, 1986).
38. Sokolovskii, *Voennyi strategii*, p. 229.
39. See Stephen S. Kaplan, *Diplomacy of Power* (Washington: Brookings Institution, 1981), pp. 148ff., for a concise analysis of Soviet third-world policy in this period.
40. Sokolovskii, *Voennyi strategii*, 2d ed. (1963), p. 228.
41. N. V. Ogarkov, *Red Star*, May 4, 1984, gives an example in the Soviet case.
42. Yurii A. Ovchinnikov, "Biotekhnologii na peredovykh rubezhakh nauchno-tekhnicheskogo progressa," *Kommunist*, no. 10 (July 1985), pp. 20-28.
43. Ogarkov, *Red Star*. See also Mary C. Fitzgerald, "Marshal Ogarkov on the Modern Theater Operation," *Naval War College Review*, vol. 39, no. 4 (Autumn 1986), pp. 6-25.
44. M. A. Gareev, *Frunze: voennyi teoretik* (Moscow: Voenizdat, 1985), p. 239.
45. *Ibid.*, p. 240.
46. *Ibid.*
47. *Ibid.*
48. *Ibid.*
49. *Ibid.*, pp. 241-44.
50. See Glantz, "Soviet Operational Formation for Battle."
51. See my "Soviet Force Posture" and Fitzgerald, "Marshal Ogarkov on the Modern Theater Operation."
52. Bruce D. Porter, *The USSR in Third World Conflicts* (Cambridge: Cambridge University Press, 1984), p. 21.

53. *Grenada and Soviet/Cuban Policy*, ed. Jiri Valenta and Herbert J. Ellison (Boulder, Colo.: Westview Press, 1986).

54. Kaplan, *Diplomacy of Power*, pp. 167-80.

55. S. Neil MacFarlane, *Superpower Rivalry and Third World Radicalism: The Idea of National Liberation* (Baltimore: Johns Hopkins Press, 1985), is the best treatment of Soviet ideology and practice in this area. Kaplan, *Diplomacy of Power*, provides the best succinct review. Porter, *The USSR in Third World Conflicts*, is the most comprehensive analysis of post-World War II Soviet use of military means in the Third World. S. T. Hosemer and T. W. Wolfe, *Soviet Policy and Practice Toward Third World Conflicts* (Lexington, Mass.: Lexington Books, 1983), is a solid work. Mark N. Katz, *The Third World in Soviet Military Thought* (Baltimore: Johns Hopkins Press, 1982), focuses on the most neglected theme of the whole area, but he infers more about internal Soviet policy debates on the subject than the evidence seems to warrant; nonetheless, it is a useful contribution. Elizabeth Falkenier, *The Soviet Union and the Third World: An Economic Bind* (New York: Praeger, 1983), explores some important dilemmas for Soviet policy, but by ignoring the military dimension, even the large profits from arms sales, she misses determinants of Soviet policy that undercut much of her analysis.

56. Gareev, *Frunze: voennyi teoretik*, pp. 434-35.

8

Clarity, Arms Control, and NATO Strategy

Richard N. Perle

Throughout their long and distinguished careers, Albert and Roberta Wohlstetter have been relentless champions of clarity and candor in public policy. Nowhere is such clarity needed more than in the private thinking and public statements of members of the North Atlantic Treaty Organization (NATO) about arms control and the military posture, especially on the topics of eliminating all nuclear weapons, halting nuclear weapons testing, and banning chemical weapons. Clearer thinking about these matters would take more directly and explicitly into account the record of Soviet violations of arms agreements. It would give high priority to deep reductions in ballistic missiles. And it would seek to restructure NATO's nuclear posture in the direction of cruise missiles and a greater balance between offensive and defensive systems.

Need for Clarity

Whatever the virtues of diplomacy in our public discourse, clarity is not among them; and yet it is clarity above all that the NATO alliance most urgently needs.

Unlike our adversary the Soviet Union, the Atlantic alliance has no party line. Members of NATO are free to dissent from majority views, and they do so frequently. At the same time they are deeply involved in the shaping of those views that are regularly expressed in convoluted and often lengthy communiques at the conclusion of each Alliance

This chapter was adapted from a speech that Mr. Perle gave at the *Wehrkunde* Conference in Munich, Germany, on February 1, 1987.

ministerial meeting. Often these communiques are the products of sleepless nights during which the bureaucrats of fifteen or sixteen nations have wrestled the English and French languages to the ground in order to paper over differences, avoid controversy, placate public opinion, round all corners, and smooth all sharp edges, as though we were designing a stealth airplane rather than declaring our most fundamental convictions. No wonder no one reads these official pronouncements except those who draft them and, from time to time, an opposition party looking for a quarrel with its own government.

At one ministerial meeting in the mid-1980s the United States proposed saying that Mr. Gorbachev would destroy the credibility of the Soviet leadership if, after having agreed not to do so, he persisted in holding an agreement on intermediate-range missiles hostage to one on strategic defense. The experienced ambassador of an important NATO nation, speaking presumably for his government (or, more likely, reflecting what he thought his minister would think if he knew what was going on in Brussels at that moment), vigorously opposed so unambiguous a formulation. "You can't say that," he declared. "Why not?" I asked. "It just isn't done," he replied. "You don't say in a NATO communique that Gorbachev has lied."

So we took a brush to that sentence and painted it pallid, sacrificing clarity to consensus, as we have done countless times in recent years. And then we wonder why the public is confused about defense, about security issues, and even, if some European polls are to be believed, about whether the president of the United States or the general secretary of the Communist Party of the Soviet Union is the more sincere in the pursuit of arms control.

How can we possibly be convincing when we cower behind bland and oblique formulations so as not to offend the sensitivities of our adversaries or the prevailing wisdom of our editorial writers? Add to the *sotto voce* murmurings that pass for alliance statements the tendency to embrace every fashionable idea, no matter how ill-founded, and you have a recipe for diplomatic drift and political disaster. It is pointless to complain of the inroads of Soviet propaganda while joining in the charade that permits it to succeed. There is in all of this an unconsciously patronizing quality to the way we choose, both as an alliance and often as leaders of member governments, to communicate with our people. It is wrong to believe that they must be protected by officials allegedly wiser than themselves from knowledge of the source and nature of the danger that threatens their security and democratic institutions. They possess the strength and resilience to face unpleasant truths, if these are only laid before them.

On such complex subjects as military strategy, defense spending, chemical weapons, nuclear testing, arms control, Soviet treaty violations, and international terrorism, a failure to be forthright or even to speak out at all—particularly among the European members of the alliance—often has led to confusion and wishful thinking of alarming proportions. In such a climate reality is subordinated to hope and policy is shaped by fear.

Soviet Proposals to Abolish Nuclear Weapons

Consider the notion that an agreement to abolish nuclear weapons would enhance our security and eliminate the threat of nuclear war. This old Soviet idea was artfully and disingenuously cultivated by Mr. Gorbachev in his January 1986 proposal to eliminate all nuclear weapons by the year 2000. It was dangerous nonsense, calculated to undermine the legitimacy of weapons that are vital to Western security—and to whose worldwide total the Soviets have been adding steadily for the past two decades.

For a quarter century the NATO alliance had relied on nuclear weapons to offset a massive Soviet superiority of conventional forces. Even after Soviet theater nuclear forces grew to exceed those of the Western allies, we sought to confront the Warsaw Pact with the threat of escalation, however unlikely, to deter aggression. Exhortations to diminish our dependence on nuclear weapons by strengthening our conventional defenses were unavailing. And despite the abhorrence of nuclear weapons routinely expressed by those least prepared to pay for conventional ones, we remained, as an alliance, unwilling to invest in a more favorable conventional balance with the Warsaw Pact.

To talk, in these circumstances, of the abandonment of nuclear weapons and the substitution of a conventional deterrent was absurd. Indeed, the very concept of deterring the Soviet Union with conventional weapons, however much they might be improved, however many divisions we might raise and equip (even with advanced conventional munitions), is hopelessly unrealistic. For, while conventional *defense* is both possible and desirable (albeit expensive), conventional *deterrence* is a dangerous illusion. Even if NATO mounted a superior conventional force, this force could not deter the Soviet Union from using its vast nuclear arsenal. As for the Soviets agreeing to eliminate nuclear weapons, what Western leader would turn in his country's last remaining nuclear weapon on the strength of assurances—mere words—that the Soviets had done the same? The simple truth is that the verification of an agreement to abolish all nuclear weapons is not difficult, or even very difficult: it is *impossible*, and Mr. Gorbachev knew that. Indeed,

he counted on it. It enabled him to propose eliminating all nuclear weapons with full confidence that the West could not agree. And he had the added insurance that if we were so foolish as to do so the Soviet Union, who would surely cheat, would wind up with a monopoly of nuclear weapons and the realization of the Leninist dream of a decisive correlation of forces. For this reason alone it was and is idle to speak of conventional deterrence or a nuclear-free world.

The foolishness of a nuclear-free world is in no way mitigated by the conditions that Western statesmen routinely attach to its achievement in order to avoid dismissing the idea as the empty propaganda that it is. To argue that eliminating all nuclear weapons is a good idea, but the year 2000 is too soon; or to suggest that it must proceed by steps or stages; or to claim that it must await a more favorable conventional balance or the settlement of regional disputes is self-defeating obfuscation. These arguments are deployed by officials and politicians who fear the loss of public support if they simply reject outright Mr. Gorbachev's beguiling maneuver.

This, I believe, is profoundly mistaken. Our people are more realistic than many politicians and most foreign offices think. They will work their way through an issue like this one, and they will get it right. But they will get it right sooner and with greater confidence if their leaders earn their pay and begin to lead. There is a good reason why French public opinion has been consistently more realistic about these matters than opinion elsewhere in Europe, and it surely lies in the greater candor of a succession of French leaders and a sometimes admirable French capacity to hold fast in the face of pressure from outside.

Moratorium on Nuclear Testing

Periodic calls by the Soviet Union for an end to all nuclear testing, and the 1985-1987 moratorium with which it sought to pressure the United States, present similar issues for the Alliance. As long as the United States depends on nuclear weapons for its own defense and that of its allies, it will find it necessary to test nuclear weapons. Without testing we would lose confidence in the weapons in our inventory; we would lose the capacity to correct failures and validate the corrections; and we would bring to a halt a critical part of the process by which we have been reducing the number and yields of our nuclear weapons while making the remaining stockpile safer, more secure, and more survivable. The conduct of nuclear tests over the last twenty-five years has been vital to the development of weapons that are a key ingredient for the credibility and effectiveness of the

American nuclear deterrent and NATO strategy. The idea that it would be a good thing to halt the testing of nuclear weapons is based on the beliefs that the development of new nuclear weapons is a bad thing and that the inevitable decline in confidence in nuclear weapons that cannot be tested would somehow make their use less likely. Neither belief holds up under analysis.

The development of new nuclear weapons, most often as a replacement for older weapons that are less reliable, less safe, and less effective, has made deterrence more robust and the nuclear threshold higher than it would have been had we retained older weapons in the inventory. Replacement weapons are less vulnerable to direct attack by the Soviet Union or to misappropriation by terrorists. Their yields are more predictable and, for the most part, much lower than those of the weapons they have replaced. The confidence we have in them, far from making nuclear war more likely, has enabled us to reduce the size of our stockpile; and greater confidence has, by strengthening deterrence, meant a more stable military relationship with the Soviet Union.

All of this has been known for some time to the leadership of the NATO alliance. Nevertheless, a number of allied leaders have urged the United States to abandon nuclear testing or restrict it sharply. And a number of American officials who are persuaded of the need to test nuclear weapons have sought over the years to avoid saying so by declaring as a "long-term goal" an end to testing and by pointing to the inability to verify a comprehensive test ban as the central argument against it. The Reagan administration was the first to express in public a view that previous administrations held in private: that a comprehensive test ban would be dangerous and undesirable even if it were verifiable—which it is not.

Thus the West, by hiding behind verification and by its silence in public about the necessity to test, helped set the stage for Mr. Gorbachev's moratorium. And by declaring that a comprehensive test ban is a long-term goal we have obscured the necessity for and the benefits of nuclear testing. Those who know better have joined with those who do not.

In this intellectual climate the Kremlin has found it easy to make us an offer that we must refuse; and we, in turn, have made that refusal more costly and less intelligible than is warranted or wise.

Chemical Weapons Ban

In Europe especially, but in America as well, the capacity to face reality was even less evident with respect to chemical weapons than

with nuclear ones. This preoccupation with a chemical weapons ban all but obliterated the central fact about chemical weapons: the Soviets possess them in quantity, train in their use, study their employment at specialized military academies, and equip themselves to fight in the midst of lethal chemicals with a seriousness wholly lacking among Western military establishments.

Most NATO allies have no chemical weapons at all; and the United States, which does, has not produced a new or modernized chemical weapon since 1969. The American program for the production of new binary chemical weapons has proceeded with glacial speed as the U.S. Congress, encouraged by an understandable trans-Atlantic abhorrence of chemical warfare, has repeatedly delayed the program in the vain hope that an arms control agreement would obviate the clear alliance requirement for a chemical weapon deterrent. When the American program did finally get under way, the allies, dragged into the American decision by a congressional tactic aimed at aborting it, managed only a furtive, barely visible nod in the direction of simple prudence. Driven by the belief that nothing can go forward that is not the subject of negotiations with the East, the United States proposed the abolition of chemical weapons in the Conference on Disarmament in Geneva.

All of this has been taking place against the background of new techniques for the manufacture of lethal chemicals that would render a treaty banning chemical weapons stocks and production facilities largely irrelevant to the question of whether a party to a weapons ban might nevertheless be poised to initiate chemical warfare. The unhappy fact is that ordinary commercial chemical plants could be converted for the production of lethal agents in a matter of weeks, if plans were laid and preparations made in advance. Thus, the practical benefits of a chemical weapons ban would be largely vitiated by an inconvenient technical fact that we have been reluctant even to acknowledge, much less comprehend, in our policies. And like so much else in this area of arms control, the burden of treaty obligations would fall far more heavily on the open democratic societies of the West than on the Soviet Union. No member of the NATO alliance could, in the aftermath of an agreement banning chemical weapons, take steps as a hedge against Soviet cheating to plan and prepare for their manufacture. In the USSR, by contrast, such activities could, and almost certainly would, proceed in secrecy.

It is therefore fair—and even urgent—to ask whether the scourge of chemical warfare is best prevented by establishing an ability to respond in kind if attacked with chemical weapons or by an international agreement banning chemical weapons that is unverifiable and unenforceable, as it must inevitably be. Thus is our alliance faced with a

hard question and an easy answer. While it pains me to say it, I fear that the hard question will remain unanswered and the easy answer unquestioned.

Soviet Violations of Arms Agreements

Since 1984 the American administration reported to the Congress and U.S. allies on the continuing pattern of Soviet violations of a number of arms control agreements. These violations were documented in detail in briefings to allied officials, including a meeting of allied ministers of defense.

I will not repeat here the details of the Soviet violations. The radar at Krasnoyarsk, the deployment of a second new type of intercontinental ballistic missile (ICBM), the encryption of telemetry necessary to establish compliance—all these are well known.

The Western alliance has, from time to time, had something to say on the subject, and various leaders of the alliance have found occasion to comment as spokesmen for their governments. Yet in all the pronouncements with which I am familiar I cannot recall seeing the word *violation*. There have been *concerns*, and even *serious concerns*, expressed about the Soviet record of compliance. There have been appeals pointing to the importance of compliance and warnings about a double standard of compliance; but nowhere have I been able to find a statement deploring the fact that the Soviets have been cheating. It is as though the words *violation* and *cheating* cannot be said in well-mannered company. How hard our allies find it to distinguish between the unspeakable and the unspoken. How easy it is to become like parents who, wishing to avoid the pain and inconvenience of disciplining their children, will pretend not to have noticed their misdeeds.

In response to Soviet violations, President Reagan felt it necessary to decide that the United States would no longer consider itself bound to comply with the provisions of the Strategic Arms Limitation Talks I (SALT I) interim agreement and the SALT II treaty, a treaty that was never ratified and that would have expired in 1985 had it been approved in the U.S. Senate.

President Reagan's misgivings about the SALT II treaty were well known. These misgivings were shared by the Senate Armed Services Committee in 1979, when it found that ratification of the treaty was not in the national security interests of the United States. Nevertheless, the president made his decision reluctantly and only after repeated attempts to persuade the Soviets to end their violations and comply. It followed more than five years of compliance by the Reagan administration, which early in 1981 had pledged to refrain from any action

that would undercut SALT II so long as the Soviets showed similar restraint.

In contrast to the halting euphemisms with which our allies questioned Soviet compliance with SALT II, their desire that the United States continue unilaterally to comply found clear expression at ministerial meetings and in many bilateral consultations. Allied governments found it easier to distance themselves from the American response to Soviet violations than from the violations themselves. The double standard, condemned in NATO communiqués, was urged upon us. And because so little was said about Soviet cheating, the American response to it was made to appear capricious and unfounded. The price of silence in 1983 was incomprehension in 1986. I believe the lesson is as clear as it is unlearned: if we fail to frame the debate that considers issues of security and arms control, if we shade reality in the belief that its glare is too harsh for our people to comprehend, we will leave it to be shaped by our adversaries for their purposes and in their image.

Reykjavik and the Strategic Defense Initiative

Of the many events that have impressed themselves on the consciousness of the NATO alliance—the Reagan succession to the Carter administration and the reassertion of American confidence in international affairs; the continuing Soviet aggression in Afghanistan throughout most of the 1980s; the implementation of the 1979 decision to deploy cruise and Pershing II missiles in Europe; Soviet intimidation of Poland; the resumption of U.S.-Soviet arms control negotiations and the Soviet walkout in 1983; the Strategic Defense Initiative (SDI)—none has had an effect as immediate and profound as the meeting between President Reagan and General Secretary Gorbachev in Iceland in November 1986. It was an occasion, unlike the summits of the past, at which an unstructured and far-reaching discussion between the American and Soviet leaders took place against the background of the impasse that had developed in the Geneva negotiations.

I believe that the Reykjavik summit changed, perhaps permanently, the path of arms control along which the positions of the United States and the Soviet Union are arrayed. No longer will treaties like SALT I and II, which allowed for substantial increases in nuclear forces, be regarded as meaningful and effective expressions of the interest we all share in arms control. Mr. Reagan moved a long way toward achieving his objective of a new and far more demanding standard by which arms control should be judged: deep reductions in strategic forces that result in greatly diminished and equal weapons ceilings.

No longer will any American administration gain easy approval for agreements that ratify and legitimize the growth of nuclear arsenals.

It is true that the discussions at Reykjavik did not reach a conclusion. But much was accomplished there. Partial agreement was reached on deep reductions of offensive forces, including a 50 percent reduction in strategic weapons and the near elimination of intermediate-range missiles; the Intermediate Nuclear Forces (INF) Treaty subsequently committed both nations to total elimination of the latter weapons. Moreover, Mr. Reagan demonstrated considerable flexibility in attempting to conclude an agreement respecting strategic defenses.

Much of the commentary that followed the meeting at Reykjavik attributed the failure to conclude an agreement to Mr. Reagan's determination to protect the Strategic Defense Initiative. While it is true that the president was not prepared to conclude an agreement that would have forced the cancellation of this vital program of research, it is quite wrong to believe that strategic defense was the only issue that could not be resolved in Iceland. At least as important, and in some respects even more important, was the president's refusal to accept a Soviet demand to eliminate all strategic arms, a proposal that would have forced the abandonment of America's nuclear deterrent and left our NATO allies vulnerable to a Soviet near-monopoly of nuclear weapons deliverable against the whole of Europe. This we could not accept.

President Reagan did suggest that, in the context of accepting a Soviet proposal to refrain from the deployment of strategic defenses for ten years, both sides should eliminate offensive ballistic missiles of all ranges. Mr. Gorbachev rejected this offer, insisting instead that we go beyond the elimination of ballistic missiles and scrap the bombers and cruise missiles that would constitute our remaining deterrent force.

Unlike the elimination of all strategic arms, which would create an intolerably adverse and unstable military balance, the phased elimination of ballistic missiles would diminish greatly the destabilizing shadow cast by that category of weapons uniquely capable of a first offensive strike. Vital NATO installations in Europe, essential to deterrence, would no longer lie a half dozen minutes or less from destruction by Soviet missiles. America's deterrent forces, reconfigured to consist of aircraft and air-launched and sea-launched cruise missiles, would be vastly more survivable. The near-continuous modernization of ballistic missile forces, carried on by both sides at enormous expense, would cease. And the threat that the Soviets insist would result from the deployment of strategic defenses would vanish as the missiles that defenses are competent to intercept disappeared from the arsenals of both sides.

With the elimination of ballistic missiles a modest SDI system would serve as essential insurance against cheating or an attack launched by a third power against the United States or its allies. And in an effort to dissipate the apprehensions the Soviets claim to feel at the prospect of strategic defenses, Mr. Reagan was prepared to agree that this modest SDI system would be deployed only after ballistic missiles had been eliminated.

Like all new ideas that challenge well-established beliefs, the idea of eliminating ballistic missiles has been greeted with considerable skepticism, especially in NATO. This is neither surprising nor disappointing. Indeed, too ready acceptance of ideas about arms control would be far more worrisome than the cautious reserve that ultimately produces more careful and considered judgment.

I believe that the Soviet strategy at Reykjavik and thereafter has been to put forth the prospect of radical reductions in strategic and intermediate-range forces in the expectation that the president would either abandon the Strategic Defense Initiative or incur the wrath of an angry alliance and a disappointed Congress. In either case the aim was to throttle the Strategic Defense Initiative in its infancy, in Iceland or subsequently. That strategy, based as it was on a massive miscalculation, has clearly failed. Far from rising up to demand an end to the Strategic Defense Initiative in order to clear the way for the elimination of medium-range missiles in Europe, our European allies supported U.S. negotiations that led to the INF Treaty. At home the Congress gave broad support to carrying on with the SDI program and backed the administration's positions in the Strategic Arms Reduction Talks (START).

But whatever its eventual consequences, Reykjavik elicited from our European allies a new and more sober regard for the difficulty of negotiating arms control arrangements that enhance Western security. For this result alone it was a weekend well spent. Looking back on the seemingly endless consultations across the Atlantic on arms control, I am reminded of Mark Twain's observation that, "To do good work is noble. To urge others to do good work is even more noble—and it isn't very hard." That we and our allies now share a deeper appreciation of just how hard it is to fashion fair, equitable, and militarily significant agreements and to find the patience, will, and resolve not to settle for less may prove to be Iceland's great contribution to our common defense and to the strength and cohesion of the Western alliance.

In this alliance of proud, independent, and sovereign democracies our most formidable challenge is to shape the desire of our people for peace and freedom into policies that protect both and to do so

with the confidence of our convictions and the candor to share them. This will demand clarity of thought and action when misty blandishments seem safer. It will take the courage to lead when the easier course is to follow. But above all it requires that we honor our freedom by giving our people the truth with which to defend it.

9

Net Assessment: A Historical Review

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The Selection Was Polar Bear

At the time, it seemed like Albert's other conferences. This was a 1978 European-American Workshop in Tromsø, Norway, a pleasant town on a fjord well to the north. The subjects discussed had to do with the rapid deployment of U.S. marines to Norway in the event of a Soviet attack.

The debate had gone on for years, and working for Scoop Jackson put me in the middle of it. Eventually both the United States and Norway came to agree with Albert's logic that a plan to dispatch American marines to equipment prepositioned in the far north was not politically or militarily realistic. Rather, both countries agreed in principle to preposition in the center of the country near Trondheim, a place where marines realistically could be deployed, and to program additional brigades of Norwegian forces to be sent as immediate reinforcements to the far north.

On the second day of the conference I saw Albert about to saunter out of the hotel at lunchtime. Knowing his affection for the noon meal, I asked him if he would be missing lunch. He gave me a knowing smile and said, "Ah, but I'm not going to miss lunch. In fact, that's why I'm leaving the hotel." "Was there something wrong with the lunch the conference would serve?" I asked. "Not at all," he replied, "but it seems they don't serve polar bear." "Polar bear! Are you

While the work of the authors is solely their responsibility, gratitude has to be expressed to Andrew Marshall for his ideas and insights on the history and role of net assessment. The three of us served in the Office of Net Assessment, covering the period from the office's formation at the National Security Council in 1972 through the years of competitive strategies in the 1980s, and participated in the development and growth of this form of analysis. Andy Marshall has been a mentor to each of us, and more than any individual has been responsible for the introduction and implementation of net assessment in the U.S. government.

serious, Albert?" His eyes began to shine even more than usual. He drew closer to me, laughing quietly to himself, and began his explanation with "Now, you need to understand something about life. . . ."

I was then treated to one of Albert's discourses on living the good life. It seems that God gives each and every one of us at birth something analogous to a book of meal tickets; one ticket for each meal we will have the opportunity to eat during our lifetime. Clearly, there are a finite number of tickets given to any one person, and each should be cherished for being so perishable. If you don't use a ticket, you can't make it up at the next sitting. Each must be consumed on an appropriate schedule in order for life to be lived correctly. "Think about it for a moment: you never know how many tickets you have left at any given time. Only God knows," he cautioned.

"And most important of all, Jim, one should never expend such a precious thing as one of the meal tickets on substandard food! What a waste of God's gift!" After pausing to make sure I grasped the import of his teaching, he went on to say, "You see, Roberta and I don't get to northern Norway often, and I understand there is a restaurant here in Tromsø that serves polar bear steaks. Now I ask you, how could I pass up this opportunity and still keep faith with God's meal plan?" Albert then turned, as only Albert can, and headed to the door.

I simply couldn't say a word, and that's not something that happens to me very often!

—James G. Roche

* * *

The salient feature of the post-World War II era was the rapid emergence of a bipolar world order dominated by long-term hostility and competition between the United States and the Soviet Union. This new world order emerged with astonishing speed during 1946–1947, and the United States was quickly forced to assume the largely unanticipated role of the dominant superpower on the planet and the leader of the Free World.

Not surprisingly, the conceptual and analytic tools needed to think about the long-term role of military power in this new security environment were little developed in the United States at the outset of what soon came to be known as the cold war. Caught up in the rush of short-term decisions and unfolding crises like the Berlin blockade, the Korean War, and the "loss" of China, the American defense, intelligence, and foreign-policy establishments struggled to develop broader strategies to guide both foreign affairs and investment in military forces.

By the late 1950s, with a respite in armed combat, concern began to develop among some analysts and government leaders that not enough attention was being given to the long-term nature of the East-West competition. These people believed that national security decision making in both the Department of Defense (DoD) and the executive branch overall focused too much on short-term decisions about weapon systems and not enough on such issues as:

- What are the long-term strengths and weaknesses of our own and foreign military postures, and how will these affect our ability to compete in the short and long term? What strengths and weaknesses are systemic and long lasting? What are the more temporary ones? What new ones are emerging?
- Are U.S. leaders being given enough insight into evolving military relationships with other nations? What are the key trends in those long-term relations?
- Is adequate understanding of long-term U.S. military capabilities vis-à-vis other nations being incorporated into broader analyses by the U.S. government? Do senior leaders in the administration understand the dimensions of the military balance?

In the 1960s Andrew Marshall, Herbert Goldhamer, James Schlesinger, and others at the RAND Corporation began to develop the conceptual framework and analytic tools needed to deal with these sorts of issues. In the early 1970s such efforts led to the creation of the discipline of net assessment that has been used in the Department of Defense ever since. More recently, during the 1980s, net assessment gave rise to the notion of competitive strategies. This chapter explores the intellectual roots of net assessment, its establishment, and the issues raised by its implementation and practice over the years within the Defense Department.

The Immediate Post-War Analytic Setting

The U.S. role in world affairs has changed significantly in several ways during the last half of the twentieth century.

First, the United States emerged from World War II as the leading world power. Europe and Asia were decimated in the destruction of that war, and only the United States had an untouched industrial base as well as a massive inventory of military equipment. Indeed, the war that had destroyed industry and the quality of life in Europe had pulled the U.S. economy out of the depression and positioned it for the explosive growth of the next few decades. This shift of power

came from and at the expense of Europe, which had led the international world for a century, but put the burden of leadership and arbitration among nations on the United States, which had limited skills in managing international affairs. The experience led to the emergence of various concepts and methods in international affairs among the intelligentsia, political leaders, and military officers of the United States.

Second, technology changed dramatically the level of violence, the geographic reach, and the suddenness of war. Nuclear weapons, long-range bombers, and ballistic missiles eliminated the barrier to attack that two huge oceans had provided the United States. Isolation was no longer a choice, nor was the United States able to rely on long buildup periods before a conflict erupted. No longer was there the luxury of years to prepare for war. Moreover, technological improvements to weapons became the hallmark of peacetime military developments. The cost, impact, and pace of such modernization required a vision about the future that the United States was unaccustomed to developing. Advances were so dramatic—nuclear submarines, high-performance jet aircraft, antiship and antitank guided missiles—that existing techniques to understand and analyze their effects on combat and on potential enemies were inadequate, giving rise to a search for and increased use of quantitative measures and other methods of analysis.

Third, the United States had to maintain a large peacetime military force to meet the requirements of being the leading guarantor of democratic ideals and peace in the world. The breadth of these weapons and forces was truly enormous: from intercontinental ballistic missiles (ICBMs) to special operations teams. While some were traditional (e.g., infantry divisions), others were so new (e.g., strategic and theater nuclear forces) that the very concepts for their employment were being developed as they appeared. Force modernization, doctrine, and operational practices all moved in parallel. And the cost of peacetime forces also provoked a long-term debate about "how much was enough," a political and analytical issue that would give rise to multiple methodologies (war games, simulations, etc.) and burgeoning defense policy studies in universities, think tanks, and public interest groups.

The fourth change of significance in the last half of the twentieth century was that nuclear weapons created an entirely new arena of warfare. Their enormous destructive power and the secrecy shrouding their development in the Soviet Union led in the late 1940s and the 1950s to a broad and serious analytic effort to determine what these weapons meant for the conduct of war, for peacetime competition, and for crisis relationships between hostile nations. For a variety of reasons it was also an arena of analysis that would be dominated by

civilians. Prestigious figures had led the postwar studies of strategic bombardment and established a degree of legitimacy for themselves. The demanding needs in these analyses to understand science, mathematics, history, economics, and politics were more congruent with the time and energy available to people in universities, think tanks, and laboratories than with life in military staffs and combat units. Particularly in the early years after World War II, the military's attention was necessarily focused on absorbing force reductions, then on rebuilding as the cold war emerged, and on supporting the nation in the crises that erupted in the late 1940s and the 1950s. Moreover, no war had been fought extensively using nuclear weapons. Civilian analysts could theorize at length without being constrained by extensive wartime data and military men could not claim unique insight based on combat experience in nuclear war. Finally, the use of civilian analysts came about because of, not in spite of, the military. It was the newly formed U.S. Air Force that sponsored the establishment of the RAND Corporation.

Analytic work on nuclear forces gradually expanded into broader areas as questions of cost, size, weapons, and force mix became part of the long-term debate within the government on the structure of the large peacetime military establishment. The tools of these analyses varied. Industrial engineering techniques were applied to defense problems in World War II and their use grew in the 1950s, reaching their point of greatest visibility in the form of systems analysis during the early 1960s. Economics and cost accounting had begun migrating from the private to the public sector in the 1930s as government managers sought tools to control the ever-increasing reach of government and improve its effectiveness and efficiency. Inherently, such forms of analysis fitted with the American psyche—a belief in academic expertise, in industry, and in rational analysis. As the United States sought to manage its first large peacetime defense establishment, it drew from its private-sector experience.

The Emergence of Systems Analysis

Systems analysis was one of the most visible analytic instruments for rationalizing U.S. military investments in the 1950s and 1960s. Secretary of Defense Robert McNamara used it to help reduce duplication of effort among the military services in missions and forces. Systems analysis capped the growth of some weapon programs by focusing attention more carefully on the threat and the mission requirement. And it legitimized the notion that complex military questions

and strategic issues could be forced to yield to the use of quantitative and carefully structured analysis.

Systems analysis was, on the other hand, as controversial as it was influential. Certainly objections to it were as much based on the politics of government as on the content of the analysis, and its advocates were as likely to overstate its virtues as its opponents were its vices. But one of its more subtle impacts was to change the decision-making environment in government. Systems analysis increasingly, and largely implicitly, set the rules by which people could gain entrance to and participate in the decision process concerning major military questions. The military services eventually trained entire cadres of officers in the tools of systems analysis. Graduate programs were established in operations research; books and articles proliferated; and systems analysis techniques were applied to a wider and wider set of subjects in both the domestic and the defense areas of government. People in government found it necessary to speak in the language of systems analysis in order to be heard or to counter the claims of systems analysts.

Eventually the application of systems analysis tools was extended to situations in which its validity was marginal, with dysfunctional impacts. Its subtle control over the debate on major issues could be seen in the use of body counts and truck kills to measure progress in the Vietnam War. Not only were such analyses of questionable military or strategic value, they diverted decision makers from broader and more realistic assessments of the war. At its worst, systems analysis oversimplified problems and led people to focus only on what could be measured, rather than on broader questions of what should be analyzed. Such historically important dimensions of military planning as understanding the psyche of an enemy, developing doctrine and concepts of operations, and searching for an opponent's weaknesses increasingly were relegated to minor roles in the development of arguments to defend programs in a budget decision process dominated largely by systems analysis techniques.

The Requirement for a Broader Perspective

Late in the 1960s changes in the U.S. military situation were to increase dissatisfaction with prevailing analytic approaches. The Soviet Union had emerged as a clear long-term competitor of the United States; the confrontational atmosphere that had developed shortly after World War II had not dissipated in the subsequent two decades and would in all likelihood continue for some time into the future. With Soviet advances in ballistic missiles and nuclear weapons, it was increasingly clear that the United States was losing whatever absolute

military lead it held over the Soviet Union. The U.S. threat to escalate to the use of nuclear weapons in a conventional war in Europe would become less and less believable. As the Soviets improved their conventional arsenals, no longer could the United States or the North Atlantic Treaty Organization (NATO) avoid investing in conventional capabilities. Nuclear weapons no longer would allow the West to defend on the cheap.

Moreover, other factors were influencing the design of U.S. forces. New weapons had to be produced, but their cost was reducing the numbers that could be fielded. As a result, the United States was moving to a smaller but higher-technology force. The decline in the number of overseas bases was changing the types of forces and weapons needed to meet U.S. obligations. Finally, the wider political-military confrontation between the United States and the Soviets was moving in the direction of a new mix of politics and military posture. Arms control was injecting itself into force decisions; the United States and the Soviet Union were talking about how to reduce the risk of conflict; and other nations—especially in the Middle East—were modernizing their military forces, acting independently of the superpowers and creating situations that potentially could drag them into a direct confrontation.

Observing what appeared to be long-term and fundamental changes, some government leaders, supported by members of the defense analytic community, realized that the costs of weapons and manpower were not going to allow the United States to simply buy its way out of this situation. Insuring against every possible adverse outcome was no longer feasible. Decision makers would increasingly be faced with the challenge of making broad policy decisions that involved accepting higher risks of weakness in some areas in order to devote resources to more important ones. Since their choice of weapons or forces could determine or constrain U.S. political and military capabilities for twenty to thirty years, the weaknesses they allowed to occur were not temporary difficulties that could easily be reversed. Yet, in the complex decision-making environment of the government, not to make such policy decisions would in essence let others make them by continuing to act as they preferred.

The analytic methods widely used at the time provided only modest help in dealing with this dilemma. While techniques like systems analysis looked several years into the future, this was done principally to determine the life-cycle costs of specific weapons or forces. Analysis was largely programmatic, trying to determine what weapons or forces should be procured, given a certain budget level. The evaluation of weapon or force effectiveness was based on how they affected the

outcome of a war or battle. For the most part, such analyses of "effectiveness" were inadequate. They overlooked the perceptual and behavioral impact forces have on potential enemies in peacetime. Moreover, modeling a battle, let alone a war, proved to be so difficult that only the analysts believed their answers, and even they sometimes had their doubts. In one classic example, the same methods that predicted wartime difficulties for NATO showed that the Arab states should have beaten Israel in each of their wars. The problem is that the critical components of war often are not amenable to quantification and modeling.

Further, these analyses did not adequately consider such broader issues as how a weapon investment would position the United States to compete with the Soviets over the very long term. The "enemy" that was analyzed was often more abstract than real. Worst-case projections frequently were made of an opponent's military technology and overall force capability. Little attention was given to enemy weaknesses or to what real people (e.g., the Soviet military) feared or worried about. And there was little attention given to how the Soviet Union interpreted U.S. force modernization. In the extreme, the approach to analysis in the late 1960s posed the risk that strategy would emerge *de facto* from a stream of acquisition decisions, rather than independently providing the basis for those decisions.

Top-level managers needed a better understanding of the long-term competition, more accurate appraisals of the real strengths and weaknesses of the United States and potential opponents, and greater insights into where long-term investments would best promote U.S. political and military leverage. These decision makers could also see that the primary competition with the Soviet Union was being played out without direct combat between U.S. and Soviet forces. The critical question was how to prevail in the long-term competition during peacetime and the critical focus was not solely on war. Measures used in systems analysis were totally inappropriate for such long-term competitive assessments, but other techniques were not available. Considerations of long-term military strategy seemed largely absent from force planning. When they did appear, it usually was to justify procurement decisions made for other reasons or project the characteristics of future wars as a basis for arguing in support of specific future force requirements and weapon systems. The more senior the defense official, the greater was the frustration with the thinking that underpinned debates within the government. And leaders in the Congress such as Senator Henry Jackson shared this frustration. How to think about overall defense strategy? How to measure whether or not even the implicit strategies of the United States were remotely effective? There

had to be more to the issue than the fact that the United States and the USSR had avoided direct combat.

The Establishment of Net Assessment

In the summer of 1970 the Fitzhugh Blue Ribbon Defense Panel noted that the absence of strategic planning was a significant weakness in the Defense Department and recommended that a net assessment and strategic planning function be established that would report directly to the secretary of defense. The panel was concerned that no one ever put the entire strategic picture together and believed that the secretary needed someone close to him who would be an unbiased advisor about where the U.S. military posture stood relative to potential adversaries. There was no mechanism within the Department of Defense to provide integrated analysis that systematically placed existing or proposed programs in the context of the capabilities of the United States and its allies versus those of possible antagonists. A way was needed to bring enemy and friendly data together with no restrictions on the information used and no limits on questions as to its accuracy or relevance. Real diagnosis was needed, not just assessments of the potential impact on the enemy in order to justify military programs that the services had already decided to pursue. The secretary of defense at the time did not, however, choose to implement the Fitzhugh Panel's recommendations to create a net assessment function.

At about the same time the White House commissioned a special study to examine the long-term military balance with the Soviet Union. During the height of the Vietnam War insufficient attention had been given to the U.S.-Soviet military situation. By 1970, however, it was beginning to be clear that the U.S. defense budget would decline after the Vietnam War was over, while the Soviets apparently were expanding their strategic nuclear forces with an intensity that seemed both unbounded and directed toward establishing clear superiority over the United States. The dominance of U.S. forces was eroding and a long-term question was how well the United States was equipped to compete with the Soviet Union in military matters. The National Security Council (NSC) appointed a study group that worked on a net assessment during the last half of 1970. Its report not only speculated on long-term developments in U.S. and Soviet forces, but recommended establishing a more permanent effort to conduct net assessments in order to develop a picture of how the competition was going over time.

In 1971 a study on U.S. intelligence operations, prepared for the president by a team from the NSC staff, the Office of Management and Budget, and RAND, also recommended the establishment of a

net assessment staff in the NSC structure. In November the president signed a memorandum directing that such an activity be formed, and Andrew Marshall established the Net Assessment Group in the spring of 1972. For reasons of bureaucratic politics as well as on the merits, the secretary of defense then moved to implement the 1970 Blue Ribbon Panel's recommendation to create the Office of Net Assessment in the Department of Defense.

The establishment of these two offices stimulated the growth of interest in net assessment and related analyses. In the office of the director of defense research and engineering (DDR&E), the net technical assessment staff that had been established in the mid-1960s increased its analyses of the technologies and weapon systems of both the United States and other nations. A net threat assessment function was established in the office of the assistant secretary of defense for intelligence in 1972. The army chose not to create a separate assessment group, but carried out its net assessment work through existing staffs and agencies. The navy eventually established its own office of net assessment in the mid-1970s, although it was abolished by Secretary of the Navy John Lehman in the early 1980s. The air force, while not establishing a separate office per se, carried out ground-breaking work in the mid-1970s in what it called operational net assessment. The basic notion was that studying both an opponent's operational concepts and plans for his major campaigns and U.S. concepts and plans from the opponent's point of view would reveal vulnerabilities that the United States could exploit. The work of the air force on North Korea was particularly impressive.

The formative years of net assessment were ones of struggle to establish its position within the defense analytic community. The president's special assistant for national security affairs signed the first NSC authorization for a net assessment (National Security Study Memorandum 186) in 1973, but by October 1973 the National Security Council's Net Assessment Group was transferred to the Defense Department to report directly to the new secretary of defense, James Schlesinger. In the White House the Net Assessment Group was a casualty of several factors: the overwhelming demands on top-level decision makers to focus on near-term foreign policy issues; the realization that the Department of Defense had the depth of resources needed to support a long-term net assessment effort; and a fuller recognition of how difficult it was and how long it would take to develop a net assessment effort in the executive branch. That Marshall and Schlesinger had earlier worked closely together at RAND paved the way for this move.

Developing the Net Assessment Work Program

Engaging the military services and the intelligence community in net assessment was a continuing task throughout the 1970s. As a form of analysis, it was new, complex, not completely amenable to quantification, and lacking in established methodological tools. To some it was threatening, to others irrelevant, and to still others a seemingly magical lever that had the potential to move the entire Department of Defense. None of these perceptions was quite accurate.

It was expected that a number of challenges would be involved in developing the analytic effort. Net assessment was not just to be a matter of conducting analyses and getting the cooperation of other agencies in collecting and analyzing data. It was to involve the development of the necessary information, analytic techniques, and styles of thinking. Consequently, in the 1970s and 1980s many projects concentrated not just on making assessments, but also on building data bases, tools, and perspectives. Meeting this challenge shaped the pace and direction of net assessment, since initially the depth and the time it would take for even rudimentary progress were underestimated.

For example, analyzing long-term trends required historical data on the forces of both the United States and the Soviet Union. Early attempts showed that for the same type of forces, U.S. intelligence agencies collected data on different aspects of Soviet forces than did the U.S. military on U.S. forces. Moreover, U.S. historical data about both sides were often absent, incomplete, or contained information that had been gathered under collection criteria that had gone through several changes over time. These limitations led to major efforts by the net assessment staff to develop common data bases and counting rules, and to assemble consistent historical data for a period of decades. In a number of cases, simply to begin the process of assessment required years of preparation in building data bases that were adequate to support the examination of trends and the testing of hypotheses about the long-term military competition.

The demands on intelligence were substantial. In addition to requiring consistent streams of historical data, net assessment posed difficult questions about the activities of potential opponents like the Soviet Union, the People's Republic of China, North Korea, and Middle Eastern states. Consider, for example, the matter of trying to understand the weaknesses of the USSR. Some intelligence organizations had a natural tendency to understate these and to overemphasize Soviet strengths. The underlying assumptions were that the Soviets would be better than the United States at detecting their own weaknesses and that they would correct these over time.

Previous work on strengths and weaknesses had largely focused on broad judgments about combat capabilities; net assessment was interested in understanding the basis for these. It was not sufficient to assert that the Soviets had a weak logistic system. What were the measures that led to that conclusion? For example, were Soviet logistics weaker than those of the United States, but perhaps still sufficient for the type of war the Soviets envisioned? Further, net assessment was interested in broader and deeper analyses of strengths and weaknesses than those that had been made previously. What would be the long-term impact on the Soviet economy of their defense spending? How deeply rooted was their concern about being invaded? How would demographic trends such as the changing ethnic mix of their population and the decline in the number of draft-age males affect the proficiency of their military establishment?

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balance

The analytic efforts of net assessment moved in several different directions as methods of analysis were developed, decision maker's needs were met, and studies were shaped to garner the bureaucratic support of agencies in the executive branch. Over a period of nearly two decades the many studies and analytic efforts of net assessment fell into six categories that are discussed below.

The Military Balances

The concept of *military balance* became the principal framework of analysis: an in-depth and long-term view of how the United States and potential opponents stood in an arena of strategic importance. Certain balances sprang logically from work that had already been done within the Defense Department over a period of years, such as the strategic nuclear balance and the NATO-Warsaw Pact or European balance, although the questions and focus of the net assessment balances might differ from these earlier efforts. Other balances were newly created or drew upon less-visible earlier work: the Sino-Soviet balance, the maritime balance, the Northeast Asian balance, and the power projection balance. A military balance was defined as something analogous to the concept of business units used by private-sector firms analyzing business strategy. That is, it defined a strategic problem or area of activity as a unit for which a nation developed strategy. Only by being so structured could an assessment really serve a senior defense official.

Some balances involved topics uniquely oriented on net assessments, but which have been greatly valued by senior officials. For example, the military investment balance focused on understanding the investment in infrastructure and systems that each side has made and would be forced to make in the future. It was recognized that neither the

broad

United States nor the Soviet Union started at any point in time with a zero defense base. Each side had made past investments in plant, equipment, weapons, and technology that affected its future progress. To understand the limits the Soviets could face on their military power twenty or thirty years in the future, one needed to look at the age of their plants, the quality of their technology, the capabilities of their work force, and their current investments in military research and development, all factors that would affect their forces several decades into the future. The military investment balance was one area in which long-term economic indicators could provide clues as to what might occur several decades hence.

Conducting assessments of military balances was difficult. Data often were unavailable. New intelligence had to be collected and evaluated. On many occasions the questions were new and difficult to answer. For example, questions of "How many?" were augmented by questions of "So what?" Thinking about the Soviet Union as a real, competing opponent had become so timid in the 1960s and 1970s that many in the foreign policy bureaucracy of the government would not even allow unclassified analyses to refer to the Soviet Union as an opponent. Until the mid-1970s, for example, army training manuals had to create a phantom enemy, called the aggressor. It was not until the mid-1970s that the army was able to obtain the approval of the U.S. foreign policy establishment to provide detailed unclassified information to its soldiers about the Soviets as a military force.

Balances done by the net assessment group in the Office of the Secretary of Defense (OSD) were increasingly focused on the considerations that mattered most at the highest decision-making levels of the government, especially that of the secretary of defense. As a result, over a period of a decade and a half OSD (Net Assessment) gradually redefined the boundaries of the various balances and influenced the ways in which people thought about them. It shifted the focus of assessment toward more broadly defined balance areas, ones for which it made sense to develop strategies. This was done in the hope that someday the Department of Defense would become more serious about strategic planning.

Weapon and Force Comparisons

To develop methodologies, enlist bureaucratic support, and focus on several near-term analytic problems, a number of comparative studies were conducted on specific topics concerning weapons, operational practices, and force effectiveness. In cooperative efforts with the DDR&E net technical assessment office, comparisons were made

of U.S. and Soviet weapons—both side-by-side (e.g., U.S. air defense guns compared with those of the Soviets) and head-to-head (e.g., NATO fighter-bombers versus the Warsaw Pact's integrated air defenses). U.S. and Soviet training of tank crews were contrasted, as was the training of fighter pilots. Even the maintenance and logistics systems of the two sides were compared.

These analyses provided insights into differences that then tempered judgments about military effectiveness. For example, it was quickly apparent that U.S. pilots were far more capable than Soviet pilots in coping with the dynamic flow of actions found in actual combat. Similarly, it was found that U.S. warships were individually more capable than their Soviet counterparts, that the U.S. Navy spent a much larger percentage of time operating at sea, and that the U.S. Navy's integration of air, surface, and subsurface forces was far better than that of the Soviets. These analyses also helped dispel or clarify beliefs about the Soviets that had achieved the status of axioms. For example, Soviet tanks had been seen by some as having design errors that would make them less valuable in combat (e.g., they had no automatic transmissions and their internal spaces were too small to accommodate tall operators); none of these turned out to be operationally significant. These studies revealed U.S. and Soviet differences in measuring combat effectiveness and often showed the contrast between what each side considered important in combat or what each was constrained to do by the skill of its soldiers or the sophistication of its technology. There were, after all, many ways to win a peacetime competition or a wartime engagement; the problem facing each side was to have a realistic and internally consistent approach to doing so.

Lessons Learned and Historical Evaluations

For a variety of reasons, the lessons of the past were areas of early and sustained interest to net assessment. First, since net assessment was providing inputs to strategic planning that might affect the United States for decades into the future, it needed at least as long a historical perspective into the past. In identifying major trends, one cannot think ten to twenty years into the future based only on data for the past two to three years. Second, historical records on both sides, including lessons learned from combat, could provide a data base from which to understand what each side considered important in combat and how realistic these perspectives might be. Third, history could give important insights into the different priorities of the two sides.

For example, the RAND Corporation prepared a comprehensive study of the Soviet campaign against the Japanese in Manchuria. In

1945 the war was largely over and the Japanese were close to defeat, two factors that might have caused people to dismiss the success the Soviets had in this offensive. On the other hand, in the 1960s and 1970s the Soviets themselves wrote about the campaign as an example of how a strategic offensive should be executed, and several high-level Soviet military leaders had served as junior officers in Manchuria in 1945. The Soviets continued to hold up the Manchurian model as an ideal into the early 1980s. Indeed, even though Japanese defensive capabilities were limited in 1945, the manner in which the Soviets executed the campaign was impressive and tended to dispel beliefs that Soviet land forces were unsophisticated military instruments. The Soviets demonstrated an impressive ability to use strategic deception and innovative tactics to create surprise; they showed the capability to traverse great distances with armored forces; and they overcame geographical obstacles that could have blunted their attack.

Another direction of historical assessment was to gather data on the performance and impact of types of weapon systems that largely came into existence after World War II. New technology had produced new classes of weapons (e.g., antitank missiles), weapons that were dramatically improved over their predecessors (e.g., air defenses and combat aircraft), and weapons and systems that would have a much greater role in future warfare than in World War II (e.g., the use of electronic countermeasures and precision-guided munitions). How well these would perform in combat and whether they would significantly change the factors responsible for success in war were unclear. Crises and wars that took place in the 1960s and 1970s involved the use of many of these weapons (and concepts for employing them) in the closest analogs to modern war in Europe up to that time. Studying these conflicts shed light on the impact the new technologies were having.

Besides Vietnam, the many wars in the Middle East provided opportunities to learn about the comparative effectiveness of Western and Soviet equipment and about the roles of training, doctrine, and innovative tactics. As is now well known, the outcomes of air battles showed conclusively that the selection and proper training of pilots was absolutely critical in giving one side an advantage when they both possessed aircraft of roughly similar technical quality. Superior tank crew training could offset substantial differences in the numbers of tanks. The effectiveness of modern air defenses in degrading the accuracy and the psychological effect of strike aviation was also apparent. While not every aircraft that was detected was shot down, the presence of capable ground-based gun and missile systems had a number of secondary cost-imposing impacts: aircraft executing attacks would re-

lease ordnance a bit farther from the target, decreasing their accuracy; an increasing share of the payload of an aircraft would have to be devoted to countermeasures rather than munitions; and funds would have to be diverted from buying more combat aircraft to buying standoff jamming aircraft to provide protection.

Special Assessment Topics

Studies of military balances, comparisons of equipment, and learning how well military forces actually performed were closely tied to giving officials like the secretary of defense more data and insights on such questions as: How do we really stand vis-à-vis the Soviets? Is this situation getting better or worse? Where will this lead in the long term? At times, studies were commissioned to examine fundamental issues or areas of enduring importance for such appraisals.

For example, top-level leaders were particularly interested in the perceptions of decision makers and entire institutions or organizations in the Soviet Union, since perceptions, along with capabilities, are the essence of deterrence. More broadly, Soviet perceptions about the long-term state of various military balances would influence their investment plans, their arms control positions, and their attitudes toward the West. How did they measure the balance of power and the effectiveness of forces? What U.S. forces did they consider the most effective, and why? What did they consider to be important? How, therefore, was the competition going in their view?

As Andrew Marshall stated,

Since the major American objective is deterrence of the Soviet Union from a wide range of activities, a major component of any assessment of the adequacy of the strategic balance should be our best approximation to a Soviet-style assessment of the strategic balance. But this must not be the standard U.S. calculations done with slightly different assumptions about missile accuracies, silo hardness, etc. Rather it should be, to the extent possible, an assessment structured as the Soviets would structure it, using those scenarios they see as most likely and their criteria and ways of measuring outcomes. This is not just a point of logical nicety since there is every reason to believe that the Soviet assessments are likely to be structured much differently from their U.S. counterparts. The Soviet calculations are likely to make different assumptions about scenarios and objectives, focus attention upon different variables, include both long-range and theater forces (conventional as well as nuclear), and may at the technical assessment level perform different calculations, use different measures of effectiveness, and perhaps use different assessment processes and methods. The result is that Soviet assessments may substantially differ from American assessments.¹

Analyses of perceptions led to better interpretations of the underlying reasons for Soviet actions and better understanding of the enduring effectiveness of long-term U.S. defense initiatives. Knowledge of perceptions enabled one to understand what impact a U.S. initiative might have on the Soviets. Of course, every action did not produce a reaction, and every reaction was not predictable. What a grasp of Soviet perceptions enabled one to do was to draw boundaries around the range of responses that had a higher probability of occurring. For example, a deeper understanding of the role the Soviets envisioned for their naval forces led to a successful U.S. strategy that planned to deploy U.S. naval forces in Soviet home waters in a global war. In other cases, understanding Soviet perceptions showed the United States could be more confident about deterring certain Soviet actions.

Analyzing perceptions has been difficult because, while the Soviets might give indications of their views in their writings and speeches, perceptions often have had to be inferred by a complex analysis of historical and cultural data, examining the pattern of Soviet actions in the past and making inferences from both these patterns and current Soviet statements. U.S. analysts have tended to assume that the Soviets hold the same deep-seated values as do Americans and would act in crises in the same manner as would U.S. decision makers. For example, some U.S. analyses have assumed that the Soviets used the same ratios of offensive to defensive forces as the United States when deciding if an attack would succeed. At times in the 1960s and 1970s analysts assumed that the Soviets saw the risks of nuclear war on the same basis, would use their nuclear systems in the same manner, and held the same views about the unacceptability of nuclear war as the United States. Analyzing perceptions, therefore, was particularly challenging because it required circumvention of the implicit paradigm of U.S. analysts, the values and perceptions induced by their education and cultural surroundings.

Analytic Frameworks and Tools

Net assessment not only had to develop many of the historical data bases that formed the foundation of military balance assessments, it also had to develop analytic frameworks and tools needed to exploit those data. Eclectic by nature, net assessment did not necessarily require the invention of completely new conceptual frameworks or analytic tools. In the U.S.-Soviet military investment balance, for example, most of the overall framework and many of the tools were borrowed wholesale from economics. Over time, however, persistent efforts to identify the most important parameters, trends, and issues

in various balances tended to reshape how people thought about such problems. Net assessment became involved in improving existing analytic methods and developing new ones, bringing methodologies from other fields into the defense sector.

By the late 1970s net assessment was sponsoring research aimed at developing these tools. For example, it initiated an effort to develop numerical scores for tactical aircraft similar to the firepower scores the U.S. Army had previously developed for ground forces. This project in turn led the defense analytic community to increase its effort to quantify the combined-arms context of air-land combat. In the area of perceptions, net assessment sponsored research into how the Soviets measured and calculated the combat impacts of ground and air forces.

In the early 1980s a multiyear effort was begun to develop more flexible analytic gaming tools. The initial motivation for this effort, which eventually resulted in the RAND Strategy Assessment System (RSAS), was concern over the limitations of the calculational approaches used to analyze nuclear exchanges between the United States and the USSR. The results of such calculations were often the basis for assessing the adequacy of the strategic balance, yet they had significant shortcomings. For example, analyses of canonical exchanges using tools like the Arsenal Exchange Model did not allow general nuclear war to arise out of conflicts such as a conventional war between NATO and the Warsaw Pact. Such models also tended to limit the ability of the Red side to fight in accordance with known Soviet goals, planning factors, targeting strategies, and other operational proclivities. The RAND Strategy Assessment System not only endeavored to ease some of these more obvious problems and limitations, it also sought to provide a much more flexible analytic tool for examining alternative scenarios and likely war outcomes than had previously been available.

Private Assessments

While many net assessment efforts were carried out to illuminate long-term issues for the defense establishment, at times special assessments were prepared specially for select top-level officials. These analyses responded to specific concerns of those leaders. They might include a candid appraisal of a military balance based on the collected views of experts in and out of the government. They might involve a speculative analysis of a possible long-term U.S. strategy, which—as real strategies must be—had to be closely held. An independent analysis might be provided of a matter that was the subject of formal reports prepared by the DoD bureaucracy. Or commentary might be offered on a topic about which a senior official was concerned in ways that

he did not want to share within the Defense Department. Invariably these private assessments were classified because of their intelligence content or foreign policy implications. One example was the antisubmarine warfare balance written in the late 1970s; another was an independent analysis of the capability of the Backfire bomber made during the Strategic Arms Limitation Talks II (SALT II) period.

Such private assessments might be regarded as attempts to circumvent the bureaucracy, as to some extent they were. They could also be criticized because they risked inadvertently overlooking some important issue, although widely coordinated analyses sometimes suffered from the same problem. Such comments, however, miss the essential purpose of net assessment and the realities of top-level decision making in both the public and the private sectors. "It is lonely at the top" is not an irrelevant phrase, because the problem of the top manager is that, while he needs candid and insightful appraisals of the environment and his organization in order to formulate strategy, seeking those appraisals through the formal processes of his institution would excite all sorts of reactions that could mute the very candor and insights he seeks. A primary goal of net assessment is to help the top-level official develop and evaluate strategies.

For some issues, seeking analyses through the more formal procedures of the Defense Department and the intelligence community can frustrate a decision maker. Agencies and military services may demand the right to participate because by charter they have institutional prerogatives in some areas of expertise that are part of the analysis, even though they may not be very proficient in those areas. Agencies that might be affected by the results of analyses demand a right to make inputs. Agencies and military services have their own agendas, as do top-level decision makers, and in the classic tradition of organizational behavior these institutions may shape their analyses to fit their agendas, not the reverse. For example, occasionally agencies were asked to support a private assessment and responded by asserting that the topic it raised was not a relevant issue; the fact that a top-level manager may have personally asked for it was not viewed as important.

Private assessments could, for example, provide the secretary of defense with quick insights for use in the decision-making processes in which he was involved. They might cut quickly through the general information of longer analyses and provide key points from his perspective. They could surface new ideas that had not or could not emerge from the bureaucracy. And they could put issues into the broader framework with which the secretary of defense was concerned.

A Definition of Net Assessment

It may seem odd that we address the definition of net assessment so late in the chapter. One must, however, understand the intellectual and bureaucratic history of net assessment in order to appreciate why a simple, precise definition would be misleading.

Net assessment has been vaguely defined since the concept was established several decades ago. Any definition is inherently limiting and in a sense contrary to the objective of net assessment, which is to investigate issues or topics in comparative military capabilities as broadly as possible in order to garner useful insights. A precise definition risks being too restrictive, as well as wrong. From time to time other government organizations have wanted to capture or limit the net assessment function for bureaucratic reasons, and a precise definition would have provided them leverage with which to carve certain types of analysis away from the net assessment office. Moreover, net assessment was not meant to be the type of analysis that is restricted to the province of a single organization. It was and is a way of thinking that should be broadly pursued.

Net assessment is the comparative analysis of military, technological, political, economic, and other factors governing the military capabilities of the United States (or some other military power) and its potential competitors (including enemies, neutrals, and friends). It is a diagnostic approach tailored to assist the policy maker with problems that affect the character and success of the total defense enterprise. It attempts to do what the policy maker in fact often does for himself in his broader responsibilities as a top-level decision maker: concern itself with the long-term U.S. military situation, how that compares to potential opponents, and what actions should be considered to improve the situation in the future. Net assessment is a form of *descriptive* analysis, in contrast to cost-effectiveness analysis, which is largely *normative* or *prescriptive*.²

Net assessment's objectives include:

- Determining the essential character and state of a military competition, not only as it now exists, but as it existed in the past.
- Describing long-term military developments and trends, including doctrine, strategy, technology, force structure, force operations, and weapons design and capability.
- Examining deep-rooted national, cultural, and other values that influence the long-term competition among nations (e.g., developing a deeper understanding of the Soviet Union's immense concern

about invasion of its homeland and the implications for their defense decision making).

- Appraising the strengths and weaknesses of U.S. forces viewed on balance against the competition and the competitive environment.
- Identifying emerging or future opportunities and risks in the military competition.
- Highlighting for senior defense managers trends that may change the long-term balance between the two sides.
- Identifying the competitive advantages and distinctive competences of each side's military force posture.

Net assessment is diagnostic. It attempts to provide an objective appraisal of a long-term situation in order to assist a senior decision maker in understanding the events that are taking place. In that sense, net assessment is an input to the planning part of the DoD planning, programming, and budgeting system (PPBS), not part of the programming process. It sets the stage or perspective from which specific strategies and plans can be developed. The Defense Department has been criticized for the absence of effective planning ("the first P in PPBS is silent"), and net assessment attempts to provide the broad strategic perspective from which real planning can be done. In the terminology of business planning, net assessment is comparable to a scanning of the business environment.

Net assessment assists top-level defense officials in developing their strategic perspective on national security. What may typically be overlooked in an examination of defense decision making is that senior managers are not just the manipulators of organizations and procedures (or just manipulated by these), but are independent actors who have their own ideas about what their organizations should do. Perceptive senior officials have their own long-term visions of the world, of where their organizations fit in that world, and of how to improve that fit. If such goals or perspectives are very different from those of their subordinate agencies, senior officials can become extremely frustrated by being caught between the goals they want to pursue and the sometimes glacial response of the organizations they lead. Ideally, net assessment helps managers such as the secretary of defense, the chairman of the Joint Chiefs of Staff, and the service chiefs develop their long-term perspectives.

As practiced in the Office of the Secretary of Defense since 1973, net assessment also has viewed the military competition between the United States and the Soviet Union (or other opponents) on a much broader basis than that of waging a battle or campaign. It has seen competition as a basic characteristic of the relationship between nations,

a competition that persists in peace as well as in war. In that competition, each side has explicit or implicit strategies and each has inherent advantages and disadvantages. Net assessment sought answers to such questions as:

- What is the basic nature of this competition? What drives it? What must each side do well in order to hold its own?
- How is the competition changing over time? Is it shifting to one side or the other, and why? Are there major changes in the basic nature of the competition that will facilitate further change?
- What are the various strategic objectives of each side? How do they organize and commit their resources to meet these objectives? What goals do they explicitly or implicitly set?
- What are the advantages and disadvantages of each side? How skillful is each side at detecting changes in the fundamentals of the competition? How does each side react to changes? How does each exploit opportunities?
- What technologies drive the competition more than others? Does one side have a comparative advantage in developing these technologies? In fielding them? Or in developing appropriate concepts of operations to use them?

Examining competition from a much broader perspective highlights the fact that choices about individual weapons or forces may involve issues of long-term strategy in addition to questions of costs and benefits. For example, in the decision to develop the B-2 bomber, the increased stimulus it provides to the Soviets (or to other adversaries) to continue investing in their air defenses and to assign a higher priority to investing in defensive systems rather than offensive ones is as important as the bomber's combat effectiveness. This program also shows that the United States intends to continue to dominate in strategic aviation, an area of competitive advantage it has had over not only the Soviet Union, but also over China and every other nation in the world. Or, in the maritime strategy, a competitive perspective focuses attention on showing the Soviets they cannot compete on an equal footing with the United States in employing naval forces worldwide. In both cases the United States is demonstrating its willingness to sustain its long-term advantages in areas important to American political-military leverage.

Net assessment is relentlessly skeptical. It questions the validity of data and judgments on the military capabilities of the United States and other nations. It searches and probes for implicit and unexamined biases or perspectives. For example, in the early 1970s several net

assessments questioned judgments that Soviet weapons were simple, rugged, reliable, and easy to maintain, and that an army in defensive positions on the battlefield always held a three-to-one advantage over the offense. Were these judgments really true? Was this how each side viewed its own situation? Did these judgments affect operational or doctrinal concepts?

One of the most difficult points to grasp about net assessment has been that it cannot be identified with any specific analytic methodology or technique. Net assessment, as a search for broad insights, is eclectic in its use of analytic tools and methodologies. On the other hand, it can be truly said that net assessment is not bean-counting, systems analysis, economic or geopolitical analysis, psychological or organizational analysis, technical comparisons of weapons, war gaming, or operations analysis. Net assessment at times may involve all of these things and is open to incorporating the findings and results of any appropriate analytic approach. To use an industrial analogy, its approach is similar to what executives at Ford do when they sit down to review their business strategy relative to General Motors. Ford will use whatever methodology is necessary to understand where it really stands relative to General Motors.

Net assessment takes a long-term perspective (sometimes as long as twenty to thirty years), which is consistent with the long period of time it takes to develop weapons and their long life in the force structure. In the current acquisition environment, fifteen years or more are needed to go from concept to a weapon in the hands of troops. Once in the field, a rifle may be in use for thirty years (e.g., the M-16), a tank for thirty years or more (e.g., the M-1), a ship for forty years, and a strategic bomber (e.g., the B-52) for half a century. Indeed, the life span and cost of such systems limit the future flexibility of both the United States and its opponents to alter the basic ingredients of their military strategies and operational practices. Selecting weapon systems for procurement should, therefore, be governed by the broadest of strategic perspectives.³

Issues Raised by the Net Assessment Experience

Opponents of net assessment continue to exist, but the persistence of this seemingly loosely structured form of analysis over the past twenty years shows it has gained a measure of acceptance. Without analysis of this type it is difficult to develop long-term political-military strategy. Periodically, congressmen have tasked the executive branch to produce net assessment analyses, and in the mid-1980s the Congress made net assessment a required function under the law when it charged

the Joint Chiefs of Staff with responsibility for conducting such assessments. Moreover, the continued existence of various net assessment offices and efforts in the Department of Defense reflects the value of its contribution.

The experience of net assessment—both the long formative period of establishing the capability and, now, the more mature time of continued production—provides some insight not only into the military condition of the United States and its opponents, but also into the operations of government. For, apart from net assessments themselves, the attempt to implement net assessment as a function in the government is a case study of the challenges of merging strategic thinking with established bureaucratic institutions.

First and foremost, net assessment has pointed out the necessity for a concept of strategy that is broader than the important, but different, approach of planning successful military operations on a theater or battlefield scale. This is not to say that developing operational strategies, such as that which in the early days of World War II focused the weight of allied effort on Europe rather than the Pacific, are not important. They are crucial. But net assessment adds another strategic viewpoint: it recognizes the long-term, usually peacetime, content of the political-military competition between states. To understand that situation and how the United States should behave in it, one cannot rely only on war games, battle simulations, and combat assessments of weapons and forces. One has to understand how each side "stacks up" over the long term, how each thinks it "stacks up," and how the "stacking up" may change in the future.

Net assessment has also affected the rules of the game for conducting analysis in government and redefined the playing field to some extent. Twenty years ago the perspective of net assessment was shared by few and its initial forays into government analysis were difficult. Now it has introduced an entire vocabulary of terms and concepts: balances, distinctive competences, comparative advantages, cost-imposing strategies, and so forth. It has brought to the forefront the consideration of issues that previously had been given less attention than they deserved: doctrine, implicit strategy, national incentives, trends, training and exercising forces, logistics, command and control, and the value of identifying and exploiting weaknesses more broadly. It has affected some of the fundamentals of good analysis, including improved measures of value, standardized data bases, and the use of historically consistent data. And it has imprinted upon the government's analytical institutions ideas that have shaped their work, such as the need to look for long-term trends and to examine the perspectives of the other side. Many of these contributions were not new inventions, but individually and

collectively their richness and role in analysis have been strengthened as a result of their use in net assessments.

One of net assessment's contributions has been to highlight the perspective of the top-level manager or government leader. Since the 1960s people in both the private and the public sectors have increasingly come to realize that the successful top-level manager has to have a long-term strategic view of his company, agency, or department. He is primarily concerned about what the world will be like several decades into the future and how his company or agency must adapt to fit into that world. The sensitivity of the organizational and analytical issues inherent in this perspective requires that top managers be supported by a small set of analysts who understand his breadth of perspective. This logic typically leads to the establishment of small, skilled staffs close to top management to assist with these thought processes.

The history of net assessment over two decades sheds light on the challenge of instituting change in large organizations. Change can come about from a variety of forces: new leaders, for example; consensus within the organization that a problem exists; the presence of organizational champions; or reactions to an organizational crisis. Net assessment has exploited all these techniques at one time or another to establish itself in the government, and it has benefited from one other important factor: serendipity. Some top-level officials in the White House and the Department of Defense saw the importance of a net assessment function in the late 1960s and early 1970s. And once this function was established inside the Pentagon, it was able to demonstrate enough success to subsequent senior leaders there to sustain the enterprise. Andrew Marshall, the individual selected to head the DoD net assessment office by his close friend James Schlesinger, understood the decision maker's needs and the unique role of net assessment, and pursued this role resolutely over the years.

The need to develop new methods of analysis and to support top-level decision makers meant that it was important to select the right kinds of people to work on net assessments. Finding people with the appropriate skills and perspectives has never been easy. Over time it was learned that the best net assessment analysts are those with broad backgrounds in one or more of the following disciplines: science and engineering, economics, history, business management, and Soviet studies. Military officers with advanced degrees in such subjects as business, managerial economics, philosophy, and mathematics have been particularly valuable because they combined firsthand experience in the realities of military operations with a broad perspective on issues. It is inherently difficult to pursue such demanding questions as: What is really going on here? Why are these things occurring? Do the

answers others give really cover the range of possibilities? For this reason essential characteristics are an inquiring mind and a willingness to employ, regardless of their sources, the methods and data most useful for addressing the issues.

Finally, good assessments are candid appraisals of the long-term strengths, weaknesses, emerging opportunities, and vulnerabilities of the United States and its opponents. Distributing that information broadly—even if it remains classified—creates a substantial incentive to mute the tone and directness of the assessments. Consequently, there must be several types of assessments, those that can be shared widely and those made available to only a few top leaders. And while they must be consistent with more widely distributed assessments, it is reasonable to restrict thoughtful speculation, emerging cautions, and highly controversial judgments to assessments kept within the offices of senior decision makers.

The Future

Net assessment will undoubtedly continue to give attention in the future to balances involving the United States and the USSR, if only to track the decline of Soviet power and to evaluate the long-term consequences of that decline. Since net assessors have tended to focus on long-term historical patterns rather than on short-term trends, they can be expected to look for compelling indications of irreversible change in the nature of Soviet power before concluding, as some have already, that the United States has won the long-term competition with the USSR.

Net assessment is also likely to pay greater attention to regional balances (e.g., East Asia, the Middle East and Southwest Asia, and India-Pakistan) that do not center around U.S.-Soviet competition. The growing importance of such balances in U.S. strategic planning arises in part from the seeming decline of Soviet control and influence outside the USSR's borders. More influential than Soviet decline, however, is the likely proliferation of advanced weaponry and weapons of mass destruction (especially ballistic and cruise missiles, sophisticated air defenses, chemical munitions, and nuclear weapons) to emerging regional powers such as India, Pakistan, Egypt, Israel, Brazil, North and South Korea, Argentina, Libya, and Iraq. Since World War II, regional conflicts involving such nations have been overshadowed by U.S.-Soviet and East-West competition. In the future, however, the growing availability of long-range, highly precise or massively destructive weaponry in the hands of such nations may greatly expand the scope, danger, and potential threat to U.S. interests of regional conflicts which the

two superpowers more easily could have controlled in the past. At the same time, competition and conflict involving these nations are likely to be fueled by long-term forces such as nationalism, demography, economic and resource problems, deep-seated religious or cultural differences, long-standing territorial rivalries, and irredentist claims. As a result, fundamental changes may be occurring in how conflicts erupt, how they are waged, and how they might be best resolved.

Such changes in the international security environment portend new challenges for future net assessments. For example, U.S. goals and interests in regional conflicts involving various powers may be quite different than they would have been during the 1970s or 1980s, when U.S.-Soviet competition was the dominant factor. Another obvious difficulty, which first emerged in the efforts of OSD (Net Assessment) during the late 1970s to develop an assessment of the Northeast Asian balance, is deciding which countries will be on which side of the conflict. Indeed, this particular uncertainty so fundamentally undermines the very use of the term "balance," which presupposes two clear-cut opposing sides, that future net assessors may have to look to other fields such as business strategy to find a satisfactory alternative concept. Moreover, data problems are almost certain to return with a vengeance. Currently, for instance, we have fairly good historical data bases on the United States, its European allies, the USSR, and Eastern European nations. Countries like India, Brazil, or Iraq tend, however, to be a rather different matter, even in terms of basic force data. As for more subtle, but potentially critical, issues like estimating what it might take to deter a country such as Iraq, here we know even less. Yet it is quite possible that precisely this sort of information, rather than order-of-battle data, will be the most meaningful to future American decision makers.

In retrospect, net assessment in the United States since the early 1970s has been a form of thinking and analysis tailored to the needs of senior managers in the Defense Department who are responsible for taking actions. The portents of fundamental change in the future security environment of the United States already suggest that making useful net assessments in the future may be even more difficult than it has been in the past. Yet, if there is one overriding lesson from the history of net assessment to date, that lesson would appear to be how extraordinarily difficult it was to do good net assessments even when faced by a single, reliable, and eventually well-understood Soviet adversary.

Notes

1. A. W. Marshall, "A Program to Improve Analytic Methods Related to Strategic Forces," *Policy Sciences*, vol. 15, no. 1 (November 1982), p. 48.

2. Interestingly, and as counterintuitive as it might seem, it is often far easier to do a normative or prescriptive analysis than a descriptive one. Prescriptive analyses have preset objectives (e.g., to determine whether to buy or not to buy) and established analytic approaches. They might stand no matter how unrealistic they are because their methodologies are accepted and because they may rest largely on differences of opinions about the future. ("Your version of the future is no better than mine.") In descriptive analyses, however, facts must be separated from estimates, the methodology is not preordained, judgments must be supported by facts or well-reasoned arguments, and the analysis must stand on its own, not on institutional prerogatives. Descriptive analyses do not begin with defined conclusions or hypotheses to be checked. They begin by asking "What is really going on here?"

3. From a strategic perspective, the long life of weapon systems is an argument for flexible systems, ones that can grow and change as the future emerges. For example, the inherent flexibility of aircraft carriers and large bomber aircraft like the B-52 enabled them to adjust to changing threats and mission requirements.

PART TWO

Looking Forward

PART TWO

Looking Forward

10

The U.S.-Soviet Competition and Western Security

J. J. Martin

How I First Met Albert Wohlstetter

In the early 1970s I was a young navy commander working in the Office of the Secretary of Defense on U.S. nuclear weapons employment policy. Several of us were engaged in a major effort to move U.S. policy from its then-heavy emphasis on very large nuclear attack options to a range of large and small options that would enhance deterrence of both all-out and limited Soviet nuclear attacks. The idea was to provide the president with responses that would be able to deny to the Soviets achievement of the political-military objectives that underlay their attack, while at the same time not putting the war irrevocably on a course that would end in the destruction of the United States.

Response without suicide was, of course, one of Albert Wohlstetter's major strategic concepts. I had heard of Albert, but had not met him before this and had not studied his work closely. Upon learning of my involvement in this revision of U.S. nuclear policy, Albert sought me out and (sometimes with Roberta) spent many hours in my office over the subsequent months, graciously helping me understand all the nuances of nuclear deterrence. He had reached the stage at which these things were obvious many years before, but, since my background was science, mathematics, and military operations, I badly needed these tutoring sessions. An added benefit from my personal point of view was that these initial discussions led to many further collegial interactions with Albert over the years and—most importantly for me—to a friendship with him and Roberta that continues to this day.

* * *

The image of competition frequently has been used to characterize the postwar relationship of the United States and the Soviet Union,

to the point where, until recently, it has been a truism among journalists and academics. Some simply took note of the ongoing competition; others disapproved of it and urged diplomatic initiatives or arms control negotiations to reduce it; a few recommended ways for the United States to gain advantages; and recently it is being asserted that the Soviets have dropped out of the global competition, that the contest is over. But it is rare to find the nature of this competition analyzed to provide a basis for these conclusions, and even rarer that strategies for competing are evaluated and executed.

Albert and Roberta Wohlstetter have contributed importantly to our understanding of Soviet efforts to gain competitive advantages and to safeguarding U.S. interests in the military competition, even though they have not used the terminology of competitive strategies and have not analyzed the structure of the peacetime military competition in a comprehensive way. Especially noteworthy in this regard is the work of the Wohlstetters on the arms race, on warning and response, on the political and military problems with the strategy of mutual assured destruction, and on Soviet strategy for dividing the Western allies. The research of the Wohlstetters has substantially improved the basis for understanding the nature of the military competition between the United States and the Soviet Union.

U.S.-Soviet Competition Not Well Understood

Despite the common use of the term competition, this complex striving between the United States and the Soviet Union for political, ideological, economic, technological, and military advantages is not well understood, at least in the West. The issue of whether the USSR has given up competing or merely changed its strategy, the reasons why we should compete effectively against the Soviet Union, and the best means for competing have not been sufficiently researched.

While Americans have a certain instinct that it is important to compete effectively against the Soviet Union, we have not analyzed the case for competing and thus find it difficult at times to convince our allies of the need for competitive actions or to justify them at home. It is especially important now to think through the relative weight of effort we should devote to competing with the USSR, when this traditional adversary is looking more benign under Gorbachev and we are faced with serious economic challenges from traditional allies and friends.

The question of why the United States should continue to compete militarily with the USSR is a natural one in a period when Soviet leaders are strongly focused on their country's economic, political, and

social problems, East-West tensions are greatly reduced, and the Soviet empire in Eastern Europe has broken up. But, while the pace of the military competition has slowed markedly and its nature is changing, the Soviet Union is still an active competitor in a number of important military areas, including strategic forces, naval forces, and research on advanced technology weapons. Under Gorbachev, the Soviets appear to have adopted a more subtle strategy rather than foregoing competition completely, with near-term emphasis on the political, arms control, and research and development (R&D) dimensions of the military competition, but probably aimed over the longer term at a substantial technological upgrading of Soviet armed forces. U.S. strategy should counter current Soviet competition efforts and should hedge against an increase in the pace of the military competition, while also seeking further Soviet movement in the direction of a cooperative relationship with the West.

It is, therefore, more important than ever to understand the nature of the U.S.-Soviet competition, in order most effectively to formulate and execute strategies for competing in the 1990s. There are many unresolved issues. For example, what elements of the competition are most important? How does one side influence the actions of the other in this complex relationship? What are the goals of each side in the competition? How does one assess who is ahead? What does competitive advantage mean? How should we develop effective strategies?

A point of departure for an improved understanding of the U.S.-Soviet competition is the appreciation that it fundamentally is a contest for power and influence in world affairs. This competition potentially has several dimensions: political, ideological, economic, technological, and military. While the United States and Soviet Union competed actively in all these dimensions through the mid-1960s, the military dimension has been dominant for the last two decades and is the focus of this chapter. Similarly, the U.S.-Soviet competition was primarily a two-sided vying for power through the 1960s. Now, however, the contest is being played out in a multipolar world, as the Warsaw Pact is breaking up, the North Atlantic Treaty Organization is on the brink of major changes, and both the United States and the USSR face new challenges from elsewhere in the world.

This chapter seeks to advance understanding of the military aspects of the U.S.-Soviet competition by summarizing and extending the limited research to date. It provides a framework for strategy formulation by describing the nature of the military competition, then develops a more structured approach to U.S. competition planning by defining planning concepts and discussing competition strategies and

their analytic support. The chapter concludes by suggesting approaches to the competition in the 1990s.

Peacetime Military Competition: Moving Beyond Traditional U.S. Planning Approaches

The essential concept in the peacetime military competition is to safeguard or restore U.S. and allied military advantages over the USSR by building on our strengths and exploiting Soviet weaknesses in more systematic and institutionalized ways than in the past. Competing effectively involves taking a long-term planning view, looking forward several moves, making past Soviet military investments obsolete, and influencing future Soviet investments in ways that improve the balance of power and enhance stability. This is to be done through a variety of means, including technology developments, weapon system deployments, force posture improvements, basing arrangements, changes to operational concepts for force employment, security relationships with other countries, and arms control negotiations.

In planning for the peacetime military competition, broad U.S. objectives are the same as in more traditional planning approaches—to deter Soviet attacks, to reassure our allies, to be able to resolve crises peacefully to our advantage, and to be able to defend U.S. and allied territory and interests in the event of war. But in today's conditions we can no longer afford the rich man's strategy of buying enough military forces to have insurance against all plausible Soviet actions, if indeed we ever could afford such a strategy. We must take more explicitly into account the fact that we are in an extended era of peace with the USSR, but not necessarily an era in which relations will always be harmonious or one devoid of military competition. We must manage whatever resources the country makes available for national security by building on our strengths and Soviet weaknesses, in order most effectively to ensure that this extended era of peace continues, to maintain an adequate balance of power with the USSR, to steer the military competition in less threatening directions, to guard against a Soviet return to confrontational policies, and to be prepared to fight effectively in the event of war.

Consequently, strategies for the peacetime military competition with the Soviet Union should not be limited to traditional planning of forces to deter or to fight in wartime contingencies. They should also seek ways to improve the U.S. and allied competitive position, as well as to improve the military balance; give explicit consideration to how the USSR plans its force posture in order to influence that planning; use a planning horizon of two or more decades in order to consider U.S.

and Soviet moves and countermoves; and evaluate alternative military investments in terms of U.S. and Soviet strengths and weaknesses. Many of these things have been done in past U.S. military planning; what is needed is to be more explicit and systematic about planning for the peacetime competition in order to use available resources to maximum advantage.

It might be argued the USSR has forsaken competition with the West and that such U.S. actions would only perpetuate the arms race and jeopardize improved relations with the Soviets. Perhaps the USSR is on a course that will lead to permanently cooperative relations with the West, but that is by no means clear. Soviet military officers still write and speak as if they are pursuing the military competition and, as noted, the USSR continues to compete actively in a number of areas. Perhaps Soviet political leaders are seeking permanently cooperative relations, but will find themselves compelled in the future by domestic conditions or by the state of the multipolar security environment to adopt policies that increase the military competition with the United States. They may find that circumstances demand a mixture of cooperative and antagonistic relations with the West. Or perhaps the current leaders will be replaced by Slavic nationalists or other authoritarians who will more actively pursue the military competition.

It may be that the Soviets are not on a track to abandoning military competition, but that they are seeking to regulate and direct it in order to make it more predictable for their planners. Yet another possibility is that the current leaders are following a breathing-space strategy, forsaking immediate competitive advantages in order to improve the Soviet economy, lull the United States into a state of substantially reduced competitive activity, gain greater access to Western technology, and emerge at some time in the future in a superior competitive position to that of the United States.

Given these possibilities and the record of Soviet return to greater hostility toward the West after periods of accommodation in the 1920s and the 1950s, we cannot conclude the USSR is about to drop out of the military competition. The United States should continue to regard seriously the military competition with the Soviet Union. It should develop strategies and carry out actions to protect its interests and positions in areas of the military competition where the USSR is still active, should promote Soviet movement toward permanently cooperative relations by making clear that America can and will compete effectively if the USSR returns to more intense military competition, and should hedge against a future reversion to greater military competition by the USSR. Further, the United States should give increased attention to other countries in the military competition: to their roles

in the U.S.-Soviet competition, to their capabilities for direct military competition with America, and to the effects on U.S. interests of their military competition among themselves.

This is not to say that the peacetime competition must be characterized by high tensions and belligerency. New leaders, effective diplomacy, arms control negotiations, and improved economic, scientific, and cultural ties may change the shape of the competition and mitigate its intensity for a time, perhaps even permanently. But without fundamental changes in one or another superpower, improved relations will not eliminate military competition between the United States and the Soviet Union in the way that competition between America and Great Britain disappeared by the end of the nineteenth century. Over time, it is conceivable that both the United States and the USSR will be so challenged by domestic problems or by other powers that we will draw together against common adversaries, but probably not soon. It continues, therefore, to be essential that we and our allies compete effectively against the Soviet Union.

There are many past and current examples of effective U.S. competitive actions, but little attention has been given to explicit long-term planning processes and strategies to help the U.S. government compete more effectively with the USSR. Broad national strategies for the military competition were examined in the late 1940s and early 1950s, especially at RAND. But this line of questioning gradually died out by the mid-1950s, to be resurrected in 1969-1970, when Andrew Marshall worked on a framework for analyzing the U.S.-Soviet long-term military competition, concentrating on strategic forces. Under Marshall's leadership, the Department of Defense (DoD) began in the mid-1970s to carry out studies of more general strategies for the military competition, drawing on business concepts for strategic planning. In 1986, the secretary of defense established the competitive strategies initiative, which addressed specific military missions or tasks that can exert strong leverage for the United States in the peacetime competition.

While these past efforts helped to foster specific U.S. competitive actions, they did not produce a well-defined analytic and organizational structure for developing long-term strategies. What specifically the United States should be doing in the military competition is still largely a matter of instinct and intuition. A more formal conceptual structure is needed in order to evaluate proposals arising from the judgments of experts, to move beyond intuition, and to reduce opportunities for the military services to use the rhetoric of competitive strategies to promote traditional programs that may not be the most effective way for the United States to compete. The next two sections outline such

a formal structure by defining competition planning concepts and describing an analytic approach to competition strategy development.

Competition Planning Concepts: The Start of a Formal Planning Structure

The U.S.-Soviet military competition is a complex phenomenon involving strategic, technological, operational, and political considerations, touching on most regions of the world, and having consequences that extend well into the future. Even to begin thinking systematically about this field demands the introduction of certain concepts to organize the material and provide a common terminology for discussion and analysis. Several appear to be important: definition of subareas of the competition, in order to break the field down into analytically tractable pieces; the distinction between ultimate prizes in the competition and more immediate competition goals, to aid strategy formulation; an understanding of which actors in this multipolar world influence the U.S.-Soviet competition in specific subareas; determination of the instruments by which each side seeks to gain its competition goals, in order to formulate strategies; description of states of the competition, as a major aid to assessing where we currently stand and to setting long-term planning goals; understanding U.S. preferences for future states, to help develop competition goals; and determination of who is ahead in the competition, which contributes to strategy development.

Subareas of the Military Competition

The totality of the military competition between the United States and the Soviet Union is too large and complicated for analysis and planning. To be manageable it must be broken down into subareas. Exactly how this breakdown is made will influence the effectiveness of U.S. planning for the competition, because the subareas will affect which DoD organizations are involved and how people in these offices think about the competition. A number of alternatives are possible, such as a "business area" approach—to use an analogy from the field of corporate strategic planning—in which subareas of the competition are aligned with DoD planning, programming, and budgeting categories. We generally favor, however, a "theater of operations" or regional breakdown (e.g., strategic or intercontinental, Europe, East Asia, the Middle East and Southwest Asia, and outer space). Dividing the military competition into geographic regions fosters the melding of technology and operational concepts more than do other approaches, encourages an active role for the Unified and Specified Commanders in planning

for the competition, aligns with how the Soviets plan for the military competition, and facilitates taking the multipolar environment into account. Even though we prefer a predominantly regional approach, however, one important business area, technology, should also be included among the subareas for U.S. military competition planning.

Prizes and Competition Goals

Prizes are the ultimate objectives each side is seeking in the competition. These must be understood in order to ensure that U.S. competition strategies are consistent with our long-term interests; moreover, understanding enduring Soviet objectives helps to determine what strategies the Soviets are pursuing. In the intercontinental subarea, for example, each side is seeking a strategic balance that will allow it greater freedom of action in crises and regional wars and that will deter large-scale attacks by the other side. Additionally—and this illustrates the point that there are asymmetries between the U.S. and Soviet approaches to the military competition, starting with objectives—the Soviet Union has sought numerical equality with, if not superiority over, the United States in strategic forces to attest to Soviet superpower status, while the symbolism of numerical equality has not been an end in itself for the United States.

Prizes, or ultimate objectives, are not the same as the more immediate competition goals of each side in specific subareas, although the two are related. Competition goals are stepping stones intended to lead to the ultimate prizes, tempered by the actions of adversaries, domestic politics, and the conditions of the competitive environment. They should be sufficiently specific to guide military investments and operational doctrine. And they should be formulated in terms of such aspects of the competition as changing the military balance; sustaining the traditional peacetime objectives of deterrence, reassurance of allies, and being able to resolve crises successfully; and improving one's competitive position. To illustrate, U.S. competition goals in the intercontinental subarea are (1) to nullify Soviet investments in ballistic missiles, homeland air defenses, and mobile missiles; and (2) to offset the effects of a variety of Soviet measures (e.g., hardening, dispersal, burial, mobility) to make targets in the USSR difficult for the United States to take under attack. Soviet goals appear to be (1) to use ballistic missiles, accurate multiple independently targeted reentry vehicles (MIRVs), and programs aimed at undercutting U.S. strategic command and control to nullify U.S. investments in strategic offensive forces; and (2) to use arms control efforts to inhibit the United States from using advanced technology for strategic offensive and defensive forces.

Influential Actors

Planning for the military competition requires an understanding of which actors can influence each side's investments and actions and the nature of these influences. Influential actors can include allies, third parties, and even actors internal to a country. In the intercontinental subarea, China is an important rival to the USSR, as are Great Britain and France. On the other hand, U.S. allies in Europe have some influence on U.S. strategic force actions, especially on U.S. arms control positions, and the Soviet Union seeks to affect the U.S. strategic force posture (e.g., the Strategic Defense Initiative (SDI)) through Western European countries. Internally, the Congress and the media are influential actors that are independent of the prime U.S. actor, the executive branch. In the Soviet Union, Gorbachev's civilian advisors are actors that are not totally aligned with the Soviet military.

Competitive Instruments

The United States and the Soviet Union use a number of means short of direct combat with one another to pursue their competition goals and ultimate prizes. These means include military forces, military operations, and diplomatic actions, used in ways intended to influence the other side's spending patterns or doctrine, to undercut the other's investments, or to impose costs on the adversary. For instance, in the intercontinental subarea deployed offensive and defensive forces, deployed command, control, communications, and intelligence (C³I) and counter-C³I systems, and R&D and procurement programs are important competitive instruments that affect the strategic balance. But military operations short of fighting also are important: strategic force employment concepts and plans, exercises, and the actions taken with strategic forces during crises (e.g., increased alert). Perhaps most important in today's strategic force competition, however, are foreign policy and public diplomacy instruments such as arms control positions, public statements, and propaganda.

States of the Military Competition

Determining where America should try to move in the military competition requires, *inter alia*, understanding what the current state of the competition is and what future states are feasible. An essential step in formulating competition strategies is to diagnose the current state, as a means to set goals and to determine what future states are likely to result from pursuit of particular strategies.

Thus, developing succinct descriptions of past, current, and alternative future states of the competition—descriptions that various parties

engaged in formulating and implementing strategies can agree are accurate characterizations—is an important ingredient of the planning process. Otherwise issues about the proper strategy will become hopelessly confused with issues about what is the current state of the competition and toward what future state we should try to move. But it is not easy to describe states of the competition, because of their complexity and multidimensional nature.

We recommend that the state of the military competition be described in terms of three dimensions: (1) the U.S.-Soviet military balance, which is a measure of each side's combat capabilities; (2) the peacetime competitive positions of the two sides, which indicate how well each can compete in various subareas in the future; and (3) the state of achievement of more traditional U.S. political-military objectives such as deterrence, reassurance of allies, and the ability to resolve crises peacefully, since planning must pursue these ultimate prizes as well as more immediate competition goals.

To illustrate this approach to state descriptors, consider again the intercontinental subarea. The strategic balance is mixed, with the United States ahead in some ways and the Soviets ahead in others. The United States has a substantial lead in manned bombers and cruise missiles over Soviet air defenses and has advantages in ballistic missile submarines. The Soviets on the other hand took the lead in intercontinental ballistic missile (ICBM) capabilities in the late 1970s and still retain it. Further, the Soviets have strong C³I and counter-C³I capabilities for wartime operations, an area neglected by the United States until recently; and the Soviets appear to be ahead of the United States in their doctrine and deployed systems for space warfare. The United States leads in both space-based and earth-based ballistic missile defense (BMD) technology, but the USSR has operational experience with its BMD system around Moscow and an expanding BMD infrastructure in its nationwide deployment of radars that can track reentry vehicles.

The state of each side's competitive position in the intercontinental subarea is similarly mixed. Through its technology, current R&D and production programs, and deployed forces, the United States is able to exercise leverage and dictate the agenda of the competition in three areas: manned bombers and cruise missiles versus Soviet air defenses, submarine-launched ballistic missiles (SLBMs), and BMD developments. On the other hand, the Soviets have a superior competitive position in ICBMs, C³I and counter-C³I for wartime operations, and deployed BMD systems, as well as in strategic arms control efforts. Both sides have good positions in space warfare.

Neither side has decisive military advantages in the strategic balance or in their competitive positions. Since achievement of the traditional U.S. strategic objectives of deterrence, reassurance of allies, and crisis management capabilities depends on denying military advantages to the USSR rather than achieving U.S. dominance, the state of these objectives is satisfactory.

Preferences for States

U.S. competition goals should reflect U.S. preferences for future states. Hence, understanding our preferences for competition states is an essential step in developing strategies and plans.

It is equally important to understand Soviet preferences, since future states of the competition are determined by their actions as well as ours. In particular, as a result of Soviet strategies, U.S. actions directed toward achieving a specific goal may lead to a different state of the competition than intended. For example, efforts to make Soviet silo-based ICBMs obsolete by increasing the accuracy of U.S. missiles may have had the unintended consequence of driving the Soviet strategic force posture to a much greater degree of mobility than in the 1960s. This has imposed costs on the USSR, but the resulting force is now much more difficult for the United States to attack effectively than the silo-based ICBMs of the 1960s and 1970s. Is this state of the strategic force competition better or worse for U.S. security than the earlier state? In other words, which state do we prefer?

For these reasons, U.S. planners should analyze and debate which of a range of plausible future states could result from contemplated U.S. actions and whether any of these states are preferred to alternatives that might result from other actions. But how to determine U.S. preferences for states of the competition? Decision theory concepts do not offer much practical help, since there are substantial problems with defining a U.S. utility function over the states of the military competition. Given the multidimensional character of preferences for states and the many organizations involved in competition planning, determination of U.S. preferences will be, at best, a crude process, perhaps a simple ranking of plausible future states. Despite these problems, it would be a mistake not to address state preferences explicitly in setting U.S. competition goals.

Illustrations of the idea of preferences are perhaps more subject to challenge than in the case of the other planning concepts, since they represent merely the author's judgments, not products of the analysis and debate that should take place within the U.S. government in order to determine what future states we prefer. Nevertheless, these examples serve to make more concrete what is meant by preferences.

In the intercontinental subarea, the United States seems to have a preference for states in which the number of ballistic missiles on each side is stabilized through arms control agreements at a level lower than today's. American preferences for ballistic missile defenses are not as clear-cut, but we probably would like to see deterrence of strategic nuclear attacks reinforced by defenses deployed by both sides, in part because we believe we can maintain a lead over the USSR in BMD technology. On the other hand, since U.S. bombers and cruise missiles already have substantial advantages over Soviet air defenses and stealth technology gives us a strong competitive position in this area, we prefer states in which strategic bombers and cruise missiles are not significantly constrained by arms agreements.

Scoring the Military Competition

Closely related to preferences for states is the matter of scoring, or assessing who is ahead in the military competition. Such assessments provide a means for achieving consensus about whether the United States should be satisfied with current trends in the military competition and can serve as a diagnostic tool to show what is good and bad about the current state of the competition. Thus, scoring helps illuminate U.S. preferences for states, but goes beyond preferences to show why one side or the other is ahead, thereby contributing to strategy development.

As with determining preferences, there are problems in developing a systematic approach to scoring. The complexity of the competition makes it difficult to assess in an overall sense who is ahead, suggesting that scoring be applied to each subarea. Even then, subareas such as the intercontinental theater or East Asia are too complex to be scored exclusively, or perhaps even primarily, with quantitative measures.

The Soviet approach to assessing who is ahead in the military competition can be instructive. The assessment procedures of the USSR start with the analysis of the nature of future wars on a theater-by-theater basis, followed by more detailed correlation-of-forces analyses for each region. This suggests that the analogous U.S. process of military balance assessment should be used to determine who is ahead in each subarea of the competition and to diagnose what it is that we like and do not like about the current states of these subareas. In addition to comparing trends in each side's warfighting capabilities through balance assessments, scoring should also address the competitive positions of each side. Evaluation of competitive positions should include the strengths and weaknesses of each side, but should take account of other indicators of competitive position as well: advantage, leverage, and initiative.

A U.S. (or Soviet) competitive advantage is a benefit actually achieved by expending resources or taking other actions to convert one's inherent strengths and the adversary's weaknesses into tangible gains. One example of competitive advantage is the ability to increase production of weapon systems whose manufacturing lines are open, as a way to offset adversary moves. Another example is the capability to draw on technologies in which the United States is ahead, such as stealth, to develop a new weapon system.

A related concept for evaluating U.S. and Soviet competitive positions is competitive leverage: the ability to make disproportionately large gains in the military competition relative to the resources expended. Leverage may be measured in terms of the adversary's cost to respond, his time to respond, or the stress imposed on his military or industrial establishments by the need to respond.

Competitive initiative is another concept that is useful for assessing competitive positions. The side that is dictating the agenda or the pace of the competition in a subarea may be said to hold the competitive initiative, since the adversary will be reacting to that side's actions, rather than undertaking initiatives of his own.

To illustrate the concept of scoring in the intercontinental subarea, the United States is ahead in bombers, cruise missiles, and SLBMs, while the USSR is ahead in ICBMs and has a better competitive position there than the United States. Neither side is strongly ahead in ballistic missile defenses, although U.S.-Soviet asymmetries make this area complicated to score.

The foregoing concepts are necessary for establishing a more formal structure for competition planning, but they are not sufficient. Analytic approaches and supporting tools tailored to the development of competition strategies also are necessary.

Competition Strategies and Their Analytic Support

U.S. strategies for the long-term military competition with the USSR should exploit U.S. strengths and Soviet weaknesses. They should be designed to achieve a number of types of competition goals: to make past Soviet military investments obsolete; to compel the USSR to make additional investments in areas like homeland air defense that are not as dangerous as its offensive forces; to influence the pattern of Soviet investments and doctrinal evolution in ways that are consistent with U.S. and allied interests; to keep the Soviet Union from undercutting U.S. and allied military investments; and to sustain U.S. competitive advantages or create new ones.

Strategies for the military competition differ from past U.S. planning approaches in several ways. Their formulation should involve explicit consideration of factors that affect strongly the ability of each side to compete, including U.S. and Soviet strengths and weaknesses for military competition; the competitive positions of each side; trends in various subareas of the competition; and plausible future Soviet military initiatives and responses to U.S. initiatives. Further, these strategies require explicit statements of the competition goals proposed actions are expected to achieve and an explanation of how these actions will, in fact, result in the stated objectives.

Explicit formulation and implementation of competition strategies should be an added dimension to past planning approaches, not the abandonment of planning concepts that have worked well. But the current DoD planning, programming, and budgeting system and the analytic tools that support it are not adequate for the development of competition strategies. The planning, programming, and budgeting system essentially is an elaborate accounting process that promotes efficient use of resources and facilitates analysis of trade-offs among programs. It is not able to develop the long-term goals and strategies that should guide the strategic allocation of resources. Indeed, the development of long-term strategies is inherently difficult and is made all the harder by the many contending factions in the Pentagon, elsewhere in the executive branch, and in Congress that potentially are involved in strategy formulation and execution. Moreover, experience with the DoD competitive strategies initiative indicates that approaches to the U.S.-Soviet long-term competition are particularly difficult for planners to grasp. While the idea of building on U.S. strengths and Soviet weaknesses is straightforward to the point of banality, how to develop specific goals and strategies embodying this concept is distinctly counterintuitive for many planners.

A framework of planning and analysis methods is needed to help move development of competition strategies from the realm of intuition into a structured domain that is more accessible to DoD staffs. Such a framework should facilitate dialogue and debate about competition strategies, in order that all relevant organizations can be part of the process of strategy formulation and implementation. Further, the framework should allow the analytic resources of the Pentagon to be used in support of strategy development and long-range planning.

Four layers are required if this framework is to be adequate for competition planning: a periodic survey of the competitive environment, a high-level strategic plan, more detailed strategies for each subarea of the competition, and actions to implement these strategies.

The prospective evolution of the multipolar environment within which the U.S.-Soviet competition takes place is central to U.S. decisions about goals and strategies. Accordingly, as a foundation for competition planning, this environment should be examined perhaps with each change of administration.

The survey of the competitive environment should determine which elements and subareas of the competition are most important, given relevant worldwide trends in economics, demographics, technology, military capabilities, domestic politics, and international alignments. The time horizon for this assessment should be at least two decades into the future, since that is the minimum period over which the full impact of competition strategies will be felt. A major part of the survey should be the perspectives of key nations in the competition, notably those of the USSR and other countries that can impact the competition, and an assessment of how their goals and strategies might evolve in the future. The results of this analysis of the competitive environment should be the validation or revision of assumptions underlying U.S. competition planning and an update of our understanding of risks and opportunities in the military competition.

The survey of the competitive environment would be used in the second layer of the proposed planning framework as the basis for developing or revising a high-level strategic plan for the conduct of the peacetime military competition. This plan should set U.S. goals in the competition, identify areas of high and low priority for U.S. strategies and actions, and enunciate a broad strategy to achieve the goals. For example, the layer-two strategy might identify specific U.S. strengths and Soviet weaknesses to be exploited in our efforts to realize competitive advantages; it might indicate how risks in the competitive environment should be dealt with in constructing a portfolio of competitive strategies across the subareas of the competition; and it might spell out improvements that should be sought in the U.S. competitive position or perhaps even set in motion efforts to change selected U.S. weaknesses into strengths over time.

The secretary of defense, or perhaps the National Security Council, needs to articulate this kind of strategic guidance to ensure that competition planning supports broad national objectives, to match U.S. commitments in the competition with U.S. capabilities and available resources, and to provide strategic direction to more detailed planning efforts in each subarea of the competition. The high-level strategic plan should be reviewed and updated more frequently than the survey of the competitive environment, perhaps every four years or with the appointment of a new secretary of defense, but it should

have the same long-term planning horizon as the survey of the environment.

The third layer of the planning framework would elaborate on this high-level guidance by developing more detailed, time-phased goals in each subarea of the competition, more detailed strategies to achieve these goals, and risk mitigation or portfolio management techniques to be applied within each subarea. Goals and strategies related to the DoD technology base should also be developed in this planning layer. These more detailed subarea goals and strategies should provide guidance for operational planning, force deployments, security assistance, and use of other policy instruments, as well as for basic research, weapon system development, and arms procurement. Because layer-three planning would focus on implementation of the high-level strategic plan, it should have a shorter planning horizon than layer two, perhaps on the order of a decade, and should be updated every year or two.

Planning in the fourth layer of the framework would translate the subarea strategies into actions for implementation within existing U.S. government processes: the DoD planning, programming, and budgeting system, the operational planning system of the Joint Chiefs of Staff, and the foreign policy and arms control processes of the State Department and the Arms Control and Disarmament Agency. Selection and execution of these actions should be based on the goals and strategies of higher planning layers, on monitoring the actions of the Soviet Union and third parties, and on observing the results of prior U.S. competition actions.

This hierarchical approach would provide the essential functions of competition planning in an architectural framework that relates military programs, operational concepts, force deployments, arms control, and other political-military actions both to one another and to broader U.S. competition goals and strategies, with feedback to the strategy process based on the moves of the Soviets and other actors and on trends in the competitive environment. This is in contrast to the more traditional military planning approach that proceeds linearly from policy objectives through missions and threats to requirements and weapon system specifications, with little feedback concerning the adversary's competitive moves during the planning cycle, little effort to integrate weapons programs, operational considerations, and diplomatic moves into a single planning framework, and little consideration of trends in the competitive environment.

The essence of the approach to competition planning outlined above is the selection of goals and strategies. Analysis to support this process basically consists of evaluation of the current state of the competition, projection of a range of future states that plausibly could result if a

candidate set of U.S. goals and strategies were chosen, evaluation of these future states in terms of U.S. preferences, and use of these future state evaluations to select a set of goals and strategies from among the alternatives being evaluated. More specifically, the following sequence of analyses should be carried out in support of competition planning:

- Diagnosis of the current state of the competition, in light of trends in the competitive environment.
- Formulation and evaluation of alternative U.S. goals and strategies for improving the state of the competition, in an iterative process of winnowing and refinement that arrives at a single set of goals and strategies. Analytic support to this process should consist of projecting future states of the competition likely to result from candidate goals and strategies by considering a range of plausible U.S., Soviet, and third party moves and countermoves.
- Support to the projection of the future states associated with each set of candidate U.S. goals and strategies through identification and analysis of Soviet goals, strategies, and actions in the military competition, and projection of these into the future in the context of U.S. goals and strategies.
- Evaluation of alternative future states of the competition in terms of combat outcomes in future war scenarios.
- Based on the above, selection of a portfolio of goals, strategies, and implementing actions.

Consideration of this set of steps suggests that competition planning analysis should be supported by four primary tools: military balance assessments, Soviet-style planning analysis, competition planning games, and military contingency analysis. Other, more traditional, tools such as regional studies, intelligence projections, forecasting, operations research, and engineering trade-off studies can make contributions, especially to the selection of implementing actions in layer four of the planning framework. Strategic planning methods used by commercial firms can help primarily by providing analogies upon which to base military competition planning concepts and approaches. But the four analytic tools mentioned above appear to have the greatest potential for competition planning.

Military balance assessments, or the analysis of trends and asymmetries in opposing force postures, are primarily of value for diagnosing the current state of the competition. They also can aid in the identification and evaluation of changes in the competitive environment,

in the determination of Soviet competition goals and strategies, and in the formulation of U.S. competition goals.

Soviet-style planning analysis applies reasoning, measures of effectiveness, and analytic tools in ways that approximate actual Soviet practices, based on an understanding of Soviet organizations, decision making, and methods. This type of analysis is different from intelligence estimates and projections in that it tries to emulate Soviet planning practices rather than to make Western-style estimates of what the Soviets are likely to do. For this reason, Soviet-style analysis is more likely to provide insights into future Soviet strategies and choices in the military competition than are traditional intelligence projections. Thus, it is an important tool for determining Soviet competition goals and strategies, for assessing the probable impacts of U.S. competitive actions on Soviet weapons acquisition and doctrine, and for identifying a plausible range of future Soviet competition moves and countermoves.

A competition planning game consists of teams of players organized to represent the United States, the Soviet Union, and other key countries. These teams would play out alternative future paths of the peacetime military competition in one or more subareas, assuming the United States pursued a given candidate set of goals and strategies. In this way, competition planning games reflect adversarial and cooperative relationships in projecting future moves and countermoves. They are primarily of value in helping to select U.S. competition goals and strategies by projecting future states that plausibly could result from various candidates. By portraying the moves and countermoves of various parties, competition planning games also can contribute to the evaluation of portfolio management alternatives.

Military contingency analysis uses combat models to determine the courses and outcomes of military campaigns in various war scenarios or contingencies. By subjecting the military balances of projected future states of the competition to contingency analyses in a range of scenarios, U.S. preferences for future states can be determined. The resulting ranking of future states can then be used to help select from among the alternative goals and strategies that give rise to these future states.

While other analytic tools can assist in competition planning, these four—balance assessments, Soviet-style analysis, competition games, and contingency analysis—are the most promising. They are, however, not currently fully developed for competition planning applications. The greatest marginal returns from improvements in analysis methods for competition planning are most likely to come from investments to adapt and improve these four tools to support the framework for developing competition strategies described above.

U.S.-Soviet Military Competition in the 1990s

Mikhail Gorbachev has set in motion trends that already are changing the military competition and that may over time result in a loss of Soviet interest in competing with America. Strategies designed simultaneously to protect our interests in the military competition and to encourage an increase in the number of subareas in which the two sides are not competing can prove effective in promoting a more beneficial relationship with the Soviet Union.

This suggests that U.S. competition planning in the 1990s should emphasize political-diplomatic initiatives, arms control, and military research and development, as contrasted with earlier periods in which we stressed weapon system production, force levels, and forward deployments. Changes in the Soviet Union and its external empire make it more realistic than in the past to pursue such competition goals as reducing Soviet subversion of American interests in Central America and negotiating substantial improvements in the military balance in Europe.

In general, however, which competition goals and strategies the United States should pursue in light of the changes taking place in the USSR and Central Europe is not clear. Competing effectively is sufficiently different from more traditional DoD planning approaches that special efforts focused on the military competition are needed. In fact, explicit planning for the military competition is needed for the 1990s, even more than in the past, for two reasons. First, U.S. defense budgets, force levels, and forward deployments almost surely will be substantially lower in the 1990s than in the past, requiring difficult decisions about resource allocations and a host of other matters. These decisions should be guided by a vision for the future that takes the military competition seriously into account. Second, while DoD budgets and force levels are declining, the security problems and opportunities facing the United States are becoming more complex and taking on a longer-term character: the shift to a multipolar security environment as Soviet power declines, the nature of the contingencies the United States will have to deal with in the future, the closer relationship between economic competition and military competition, and the prospects for seriously advancing Western security interests through arms control. Many of these problems and opportunities will be related to the ongoing military competition involving the Soviet Union and other countries, and explicit competition strategies and planning are needed to help understand U.S. security interests and goals in this new environment and how best to use available resources to advance them.

Something like the planning concepts, four-layered planning approach, and analytic support described above is needed to provide a systematic way for the U.S. government to develop and articulate future American security and foreign policy goals and strategies. In particular, the kind of analysis discussed here is needed in order to understand which of a variety of feasible, less-threatening Soviet futures we should prefer and to determine the best strategy for influencing the future international role and position of the USSR in this direction.

One way to embody competition planning concepts and methods more systematically in government processes is to insert the language and substance of competition strategies into existing planning mechanisms, as the Department of Defense has done with its competitive strategies initiative. But the sweeping nature of the changes taking place in the postwar security regime, the multipolar nature of challenges to U.S. security interests in the 1990s, the growing economic dimension of these security interests, and the subtlety of competition planning concepts all indicate that changes should be made to existing U.S. security planning mechanisms. These changes should, *inter alia*, incorporate more systematic competition planning methods and analysis tools.

Planning for the U.S.-Soviet military competition is the kind of problem Albert and Roberta Wohlstetter delighted in taking on and that they have done so well in solving. The challenge of devising new strategic concepts and analytic methods to address the complex competition environment of the 1990s and of applying these approaches to determine specific U.S. goals and strategies is reminiscent of problems they worked on in the past. Perhaps most analogous is Albert's treatment of U.S. strategic force basing in the late 1950s, but their analysis of connections between the nuclear fuel cycle and nuclear weapons proliferation in the 1970s also is comparable. In this tradition, the colleagues and students of Albert and Roberta have ample inspiration for addressing problems of global military competition in the 1990s.

11

Deterrence, Stability, and Reassurance: U.S. Nuclear Strategy After the Fall of the Soviet Empire

Fred S. Hoffman

MLF will scare Brezhnev.

I hope he is half as scared as I.

—Tom Lehrer, *The MLF Lullaby*

A Working Lunch with Albert

It was late 1953 or early 1954 when Albert and I visited Paul Weidlinger in New York. Harry Rowen was away, spending two years at Oxford. Paul, a whimsical design engineer of Hungarian extraction, had delightedly seized the opportunity to work with us designing blast shelters to protect aircraft against nuclear attack on learning that orthodox opinion held this to be entirely infeasible. Accompanying Albert and me was Jack O'Sullivan, a burly no-nonsense former construction boss who looked the part, but who also liked to read Proust. Another colleague, Mike Arntsen, a Polish mathematician firmly of the view that things generally turned out badly, was also along.

We had been working in Paul's office all morning and were so engrossed in our efforts that it came as a surprise when someone noted that it was lunchtime. The general view was that we ought to send out for something and continue working. Events were moving in that direction when Albert suddenly brightened and observed that there was a very nice restaurant close by where we could quickly get a good lunch. Jack muttered something about "that being that for the day's work." Albert was, however, off, the rest of us trailing at various distances.

With never a look at a phone book to get the address, we set off at an energetic pace to find the restaurant, "Charles à la Pomme Soufflée"—only a few blocks away, Albert assured us. At the end of half an hour of what appeared to be a random search, Albert exclaimed in triumph that it was just around the next

corner. We turned the corner and saw a vast hole into which some New York real estate magnate was preparing to put a future skyscraper. Jack was now muttering something about hamburgers, Mike was shaking his head resignedly, and Paul was bemused.

In the next hour or so Albert gave us a tour of most of New York's construction sites, looking progressively more puzzled as each hole in the ground appeared where Charles was supposed to be frying his *pommes soufflées*. Just when it appeared that we would have to lunch at a coffee shop, we turned another corner and found ourselves at the mythical restaurant. Unfortunately, it was past two o'clock and the waiter informed us that lunch was over. Albert, his reputation with his colleagues now clearly at stake, was superbly persuasive, and we were all duly introduced into the delicious mysteries of the airiest french fried potatoes available on this side of the Atlantic.

And we did get back to work—though we hadn't been at it long before Albert began offering some modest suggestions for dinner.

* * *

Recent instability in Eastern Europe appears to have made the world better, refuting Dr. Pangloss. The radical changes of 1989–1990 show that stability as a goal of our strategy cannot be taken to mean the absence of change, not even rapid change.¹ Unless the current direction of political change in Europe is interrupted we will have to adapt our strategy to a situation radically different, and far more hopeful, than the one that has dominated our plans and posture since the end of World War II. Discussion of the military impact of these changes has emphasized their extreme effects on the conventional force balance in Europe and on the future of the North Atlantic Treaty Organization (NATO).

By comparison, there has been far less public attention to nuclear issues since the Berlin wall was breached. These issues include the extinction of the already dim prospects for short-range theater nuclear force (TNF) modernization, a possible acceleration of the Strategic Arms Reduction Talks (START), and denuclearization of the territory of a unified Germany. The last has been the weightiest issue to come up for discussion in even a tentative way, and it has hardly received the attention its political significance would merit. Surely the changes will go further and deeper than discussion to date would suggest.

Some directions of change can be projected with reasonable confidence. The less we need to scare Brezhnev's successors, the more interested we are likely to become in reassuring ourselves about our nuclear posture. Whatever its importance before the events of 1989, the distinction between deterrence and reassurance, introduced by Sir

Michael Howard in 1982, is likely to become crucial in nuclear strategy from now on.²

The limited attention so far to the future prospects for nuclear strategy is symptomatic of how isolated that branch of our strategy has become—a kind of art for art's sake—and how divorced it now is from its primary purposes. *Stability*, in the context of nuclear strategy, has acquired a highly restricted meaning, without explicit relationship to plausible contingencies of conflict or other aspects of our military posture, much less to the political objectives that motivate our posture. Such isolation is tenable only in a period free of change, though even then at high cost to the robustness of our strategy if tested by events. In a period like the present, reconsideration of nuclear strategy is unavoidable.

The Past Objectives of U.S. Nuclear Strategy

U.S. nuclear strategy has traditionally professed four objectives. With varying emphasis over time, it has sought to:

- Deter overwhelming Soviet conventional attacks.
- Reassure nonnuclear allies against Soviet nuclear coercion and deter nuclear attacks on them.
- Deter Soviet nuclear attacks on the United States.
- Limit damage if deterrence fails.

Western nuclear strategy has long embodied mutually inconsistent elements, which have fortunately never been put to the test of extreme crisis or armed conflict.³ In particular, mutual deterrence, as embodied in the objectives of the Antiballistic Missile (ABM) Treaty, is compatible at most with the third of the four professed objectives of nuclear strategy, deterrence of attacks on the United States. To begin, therefore, we need both to identify the issues of nuclear strategy arising from recent changes and to note those remaining from the past. These issues are related to the first, second, and fourth goals of U.S. nuclear strategy.

Detering Overwhelming Conventional Attack

As an institution, NATO has traditionally assumed that it faced superior Warsaw Pact conventional forces and that the Soviet Union, unless deterred by the prospect of a NATO response that included nuclear weapons, might actually employ its military power in a frontal attack. NATO's answer has been the flexible response strategy: reliance

on the threat of nuclear response to overwhelming conventional attack. Growing doubts prompted NATO to try to bolster the credibility of the threat to use U.S. strategic nuclear forces by linking that threat to escalation from the use of theater nuclear forces.

Concern over the threat of Soviet conventional attacks and the credibility of Western nuclear response is largely in abeyance now, at least temporarily. (Some, including influential Europeans, have argued that the threat has been remote for decades.)⁴ It is now reasonably probable that asymmetric force reductions and Soviet force withdrawals from Central Europe, unilaterally or by agreement, will leave NATO in a situation of effective conventional arms parity with the Soviet Union there. Such a situation would not require rewriting the infinitely flexible NATO strategy of flexible response, but it would surely change NATO's role, if not its structure.

In places away from Central Europe, where major Western interests might be threatened by large Soviet conventional forces, the role of nuclear threats in supporting conventional capabilities has never been as explicit as in NATO's central region. Western naval strength has long made unnecessary a nuclear response to a conventional Soviet attack on Japan. Supported by U.S. air and land forces, South Korea's growing strength should continue to be adequate to deal with a conventional threat from North Korea, even if that country were supported by the Soviet Union or China. With the exception of Turkey and possibly of the Persian Gulf, the remaining Soviet conventional threats to Western interests are in areas inappropriate for massive blitzkrieg attack, but where air and naval forces could be decisive. Even in those two areas contiguous to Soviet territory, terrain would pose initial obstacles to a massive Soviet land attack. The future, therefore, holds no obvious need for the West to rely on nuclear weapons to deal with conventional attacks, barring excessive Western disarmament.

Reassuring Nonnuclear Allies

The U.S. guarantee of nuclear responses to nuclear attacks against the territory of nonnuclear allies, notably Germany and Japan (as well as to attacks against U.S. forces based on their territories), has made it possible for these economically and technologically advanced countries to remain nonnuclear. Preserving an environment that allows Germany, Japan, and other allies to satisfy their security needs while remaining nonnuclear in the future is a matter of considerable importance for international security.

In the past the common assumption has been that NATO was more likely than the Soviet Union to initiate the use of nuclear weapons in

a war. If NATO approaches conventional parity with the USSR this might change, possibly elevating the relative importance of the U.S. nuclear guarantee against Soviet initiation of nuclear attacks. On balance, however, the importance of this consideration for U.S. strategy and force posture appears likely to recede unless the Soviet Union returns to an overtly hostile and aggressive policy toward the West.

The state of relations with the Soviet Union will also be a primary determinant of the level of concern of the nonnuclear countries. In the near future, their concerns would become acute only if a worsening of relations with the Soviet Union coincided with growing doubts about the U.S. commitment to their security arising, for example, from a U.S. retreat from its forward-defense strategy. Continued proliferation of nuclear weapons or other weapons of mass destruction and the means for their delivery, particularly ballistic missiles, might also elevate concern about nuclear threats among U.S. allies over the longer term. This will continue to be an important reason for trying to slow such proliferation and also suggests considering the long-term role of ballistic missile defense (BMD) in the future security postures of Germany and Japan.

Limiting Damage if Deterrence Fails

The incoherence of Western strategy has been especially pronounced regarding the objective of limiting damage in the event that deterrence fails. The strains were evident long ago as Soviet programs made their strategic nuclear forces difficult to attack, eroding U.S. counterforce capabilities, while the United States abandoned its air defenses and, in the ABM Treaty, surrendered the right to pursue ballistic missile defense. In the prevailing view, these changes, together with the assumption that any use of nuclear weapons would lead to a prompt exchange employing the bulk of the nuclear inventories on each side, have effectively insured that damage would be catastrophic if deterrence failed. The result has been to weaken the credibility of the flexible response strategy. The assumption about the inevitability of unconstrained use of nuclear weapons, largely unchallenged by either side in the debate over the Strategic Defense Initiative (SDI), also channeled those arguments into a pointless dispute about whether essentially leak-proof defenses were feasible or affordable. If, however, the new strategic climate leads to deep reductions in strategic offensive forces, feasible and affordable strategic defenses may offer a high level of protection, bringing the damage-limiting objective within reach. Defenses may also be seen as necessary to insure against cheating under such agreements to make deep reductions in strategic offensive forces.

Resulting Issues for Nuclear Strategy

The coherence and priorities underlying U.S. strategy have long been criticized from widely divergent points of view. One line of criticism developed since the 1950s by Professor Albert Wohlstetter has stressed the problems created by unduly restricting the analysis on which strategy is based. In the 1950s Wohlstetter introduced the "second-strike" theory of deterrence, pointing out that deterrence required the ability to respond to attack using strategic offensive forces and a command and control structure that could survive Soviet attacks deliberately designed to destroy them. These Soviet attacks were in general different from the massive, "worst-case" attacks on which most analyses then concentrated, and still do.⁵

As they have until now, those performing "worst-case" analyses in the 1950s concluded that Soviet nuclear attacks led to mutually disastrous outcomes and drew the comforting implication that the attacks would never come. Wohlstetter pointed out that these analyses permitted us to ignore much more plausible attacks that might be disastrous for us, but could achieve Soviet objectives. As the emphasis on "worst-case" attacks led to official belief that a state of mutual deterrence existed between the United States and the Soviet Union based on mutual assured destruction capabilities, he emphasized the incompatibility of this belief with our professed strategic objectives. Also, beginning in the 1960s, Wohlstetter extended his critique to the analysis of our strategy for conventional conflict, attacking the notion that contingencies outside of NATO's central region could be treated as "lesser included cases" that did not require additional or different kinds of forces.

Views similar to those of Wohlstetter were expressed more recently by the Commission on Integrated Long-Term Strategy. The commission's report held that U.S. strategy focused excessively on the extreme contingencies of a frontal attack by the Warsaw Pact on NATO and a massive nuclear exchange employing the bulk of U.S. and Soviet nuclear inventories to devastate one another.⁶ The commission called for greater attention to other threats to Western security, a position that was interpreted (incorrectly, according to its cochairmen and several of its members) by some prominent European strategists as suggesting a downgrading of the priority accorded Europe in American strategy.

Like the commission, Sir Michael Howard, one of the European critics, had noted in 1982 the incoherence of basing deterrence on threats of extreme destruction.⁷ With a more sanguine view of the Soviet military threat to Europe, however, he proceeded in a different

direction, focusing attention instead on the distinction mentioned earlier between *deterrence* and *reassurance*. He argued that the politically important task had long been to provide affordable reassurance to the Western European publics against a threat that, "however remote, cannot be entirely discounted," in contrast to the task of deterring the Soviet Union from actually using their military forces. Sir Michael went on to assert that "in Europe the Soviet Union is very widely seen as less of a danger than is the prospect of nuclear war," noting that European and American attitudes differed in this regard.⁸

The outcome of the issue of deploying improved intermediate nuclear forces (INF) in NATO Europe makes it unclear whether this was in fact the prevailing Western European attitude on the Soviet threat at the time. There can, however, be little argument about the current situation. Whatever the pre-1989 attitudes or the reality of the Soviet threat and the feasibility of relying on nuclear weapons to deter or counter it, we now appear to be entering a period in which Sir Michael's characterization will be seen as valid on both sides of the Atlantic. Some of the incoherence of nuclear strategy will become indisputably less important, if not totally irrelevant, if the direction of change in Central Europe persists and the Soviet Union seeks to remedy its internal disarray by reducing the military threat it poses.

Writing in the atmosphere of East-West confrontation of 1982, Sir Michael and Professor Samuel Huntington agreed that the goal of restoring an eroded nuclear deterrent might be in conflict with that of reassurance of the European allies. While agreeing also that the conflict might be resolved by correcting NATO's conventional force inferiority, neither believed that this was likely to happen along the lines of existing NATO strategy and resource commitments.⁹ If current trends continue, and the West constrains the formidable ability of democracies to win disarmament races, their preferred remedy may come to appear eminently feasible. This happy prospect would, however, still leave substantial problems. Failure to deal with them would, at best, waste an opportunity to increase Western security; at worst, it would leave us with new dangers.

In sum, the first two objectives of our nuclear strategy—deterring Soviet conventional attacks and reassuring allies—which have given nuclear weapons a positive role, are likely to recede in importance. The fourth objective, limiting damage in the event of attack, is more complex and is discussed at length below.

The importance of the third objective, deterring nuclear attacks on the United States, will grow relative to the first two. Nevertheless, since neither the United States nor the Soviet Union has reason to fear an invasion of its territory by the other, nuclear weapons probably

will increasingly be perceived by the U.S. public as supporters of disarmament have viewed them. They have long argued that nuclear weapons represent the major danger in U.S.-Soviet relations, rather than a necessary means to deter conflict between them. Still, it is not possible to disinvent nuclear weapons. The United States and the Soviet Union will continue to want to hold stocks of nuclear weapons at levels that set them apart from China, France, and the United Kingdom, let alone from other smaller nuclear powers. And, as long as these weapons exist, we will need a force posture and a doctrine for using them that is consistent with their future strategic roles.

This new security environment is likely to raise or give renewed prominence to several issues. Primarily, it is likely to intensify public demand to be reassured against the risks posed by the nuclear weapons themselves. Greater acceptance of the view that the purpose of U.S. and Soviet nuclear weapons is limited to deterring their use against one another will intensify public pressure to reduce the stocks of nuclear weapons below START levels, whether strategists find this stabilizing or not. In actuality, reductions to substantially lower levels in subsequent agreements almost certainly would raise issues of stability, unless U.S. command, control, communications, and intelligence (C³I) and force vulnerability problems received higher priority and more effective treatment than they have in the last two decades. And the smaller the stocks of weapons, the greater will be the significance of levels of cheating against which credible verification capabilities cannot give reassurance.

Forced to continue living with nuclear weapons, the public is also likely to require reassurance that our posture and plans do not themselves increase the risks of war. It will be difficult to offer such reassurance as long as planned responses to attack are perceived as requiring an instantaneous decision to launch the bulk of the nuclear inventory. The public is also likely to intensify its demand to be relieved of the threat of catastrophic damage in the event of war. The assessment of defenses will take on a different complexion if the new climate of U.S.-Soviet relations leads to agreements to make deep reductions in strategic offensive forces.

The debate over the Strategic Defense Initiative, focused so far on whether defenses can protect against an unconstrained Soviet use of its present massive nuclear inventory, would be clearly irrelevant to such a situation. Instead, the issue would be the utility of defenses in protecting civilian and military targets against much smaller Soviet forces or those of other countries possessing weapons of mass destruction, as well as the role of defenses in insuring against cheating under agreements to make deep reductions in nuclear offensive forces. More-

over, in such a world, U.S. allies possessing the necessary technology and who are not constrained by the ABM Treaty, particularly nonnuclear powers like Germany and Japan, may choose to pursue strategic defenses on their own if the treaty continued to block cooperative U.S. and allied efforts leading to BMD deployments. Indeed, if faced with a choice in the long term between a defended Germany and Japan and a nuclear Germany and Japan, even the Soviet Union would hardly choose the latter.

To muster continued public support, our future offensive and defensive forces, their basing, the C³I for controlling and directing them, and doctrine and plans for using them will have to be designed to meet likely demands for greater reassurance against nuclear catastrophe. The remainder of this paper considers some aspects of the issues we will face in achieving such a posture.

Stability and the First-Strike Paradigm

A major conceptual obstacle to increasing reassurance is the first-strike paradigm, which, together with the associated concept of instability, has dominated nuclear strategy for over two decades. *Stability* refers to the strength of deterrence after deterrence has partially failed. In contrast to *deterrence*, which refers to the strength of incentives to refrain from changing the status quo by force, stability deals with the strength of incentives to avoid further disturbing the status quo and to return to the status quo ante after an initial disturbance.

Partial failures of deterrence might be crises or even wars between the United States and the Soviet Union. They would be *partial* so long as they remained short of attacks using the bulk of the nuclear inventories on both sides, leaving each with a stake in restraining further destruction. Stability is a valid concern because experience and intuition tell us that partial failures of deterrence are likely. For the foreseeable future, the Soviet Union will remain heavily armed with both nuclear and conventional weapons. However nonaggressive its current policy may appear, we cannot rule out the future possibility of war between the United States and the Soviet Union in our national security planning. And, in the nuclear era, it is absolutely essential to avoid a total war. Our strategy must also reconcile the maintenance of a stable deterrent with the need for reassurance.

The potential causes of disturbance are commonly recognized to be diverse and unpredictable. Since the 1960s, however, discussion of strategic stability has increasingly focused on a narrow aspect of strategic stability that arises from the fear a nuclear first strike. In one such treatment, the authors characterize "the narrowest calculus of deter-

rence" as involving an assessment by a "rational leader" of "whether the adversary's retaliation would cause unacceptable damage. . . . First-strike stability rests on a different calculus, namely, the cost of striking first compared with the potential cost associated with waiting and possibly incurring an enemy first strike." These authors assert that stability "offers a more relevant and demanding criterion than the narrower concept of deterrence. . . ." ¹⁰

Current usage in defining a first strike is illustrated by the following:

A first strike is defined for this purpose as an attack with strategic nuclear weapons by Country A on Country B's strategic nuclear forces, i.e., the forces capable of striking, first or second, Country A's homeland. Country A's first strike also may include an attack against value targets—i.e., theater projection forces, leadership, and vital urban-industrial targets—in Country B. A first strike may arise out of an ongoing localized conflict in which vital superpower interests are threatened—whether or not nuclear weapons have been used. ¹¹

As its name suggests, the first-strike paradigm makes the order and timing of events the crux of the assumed outcome for both sides. The advent of ballistic missiles greatly intensified the "compression of time" as a major element of the paradigm, evoking for many the alarming image of a hair-trigger Western gunfight that would end civilization, if not life on the planet. Striking first, or at least not striking second, meant deciding on and executing a response within minutes of the first electronic warning signals of an attack in progress. In the limit this has led to perceptions that both sides relied on the doctrine of launching on warning or variants of it to avoid the destruction, not only of recallable bombers, but also of unrecallable missiles. For example, Caspar Weinberger explained the role of missile warning and attack assessment sensors as follows: "In the event of a missile attack, the ICBM and bomber forces, and some strategic C³ systems, would *depend for their survival* on timely warning information." ¹²

Such a posture is particularly alarming when taken together with another aspect of the paradigm suggested in the quoted definition, which states that a first strike "may include . . . value targets." In fact, despite extensive discussion of limited nuclear options over the past two decades, the most common assumption has been that a first strike would cover a comprehensive target list, including economic as well as military and government targets, and would employ the bulk of the attacker's available strategic nuclear inventory. In such an attack, the side striking first would have done its worst, by intent or as an unintended result, leaving little incentive for restraint by its victim.

The assumed nature of the attack rests on a compound of beliefs that the inevitability of escalation would lead to the use of the entire force sooner or later, that unused forces would be vulnerable to the retaliatory response, and perhaps most of all that the vulnerability of the attacker's C³I system would jeopardize the utility of any unused forces.

These doubts about the ability effectively to strike second with a damaged force provide the presumed incentive not to wait. In a crisis, the paradigm continues, each side, knowing the other's incentives, recognizes it is caught in an unstable process. Both are trapped in the Prisoner's Dilemma. The first-strike paradigm thus goes beyond Henry Kissinger's proposition that "even paranoids have real enemies" to assert that "paranoids *create* real enemies."

In sum, the first-strike paradigm portrays a situation in which the large nuclear forces of each side are poised for immediate and massive attacks under doctrines that hold it vastly preferable to launch a first strike rather than to be subjected to one. With good reason, Western publics remain unconvinced that such a posture can be trusted in a world of chance events, misunderstandings, mistakes, and accidents. So long as this paradigm continues to dominate U.S. thinking about nuclear strategy, no likely level of nuclear weapons reductions can offer a substantially higher degree of public reassurance about the safety of our society.

The heart of the first-strike paradigm has been the increasing vulnerability of silo-based ICBMs and C³I systems as the accuracy and numbers of each side's nuclear forces grew while the ABM Treaty prohibited ballistic missile defenses. To consider the prospects for a safer and more stable posture the remainder of the chapter examines, in turn, force vulnerability, C³I vulnerability, and the prospects for defenses.

The Vulnerability of Nuclear Offensive Forces

The first-strike paradigm's grip on nuclear strategy does not appear to have been affected by the diminishing significance of silo-based ICBMs in the forces of both sides. (Part of the reason for this has been the continuing concern over C³I vulnerability discussed below.) Currently a substantial fraction of the forces on each side consists of systems that are based in ways not subject to the compression of time in reaching a decision to strike.¹³ It has long been true that, regardless of who struck first, initial counterforce attacks could not have prevented a devastating retaliatory response. U.S. or Soviet surviving forces were virtually certain to be large enough so that, viewed from the perspective of national interests, the outcome of an unrestrained strategic nuclear

exchange would have been indistinguishable for the attacker and the victim. Nevertheless, while the prevailing view has insisted on the impossibility of restraining a nuclear exchange, the persistent vulnerability of silo-based ICBMs has driven U.S. doctrine and plans. At the same time, the fruitless effort to reduce that vulnerability by arms control agreements has been the primary motive driving our arms negotiations posture.

Force reductions under START, and even more under subsequent deeper reductions, will exacerbate our vulnerability problems if we insist on retaining our present strategic Triad and especially if we do not remedy the vulnerability of our ICBMs. If we maintain the Triad with substantially reduced total forces, the number of forces in each leg may fall to a point that raises new vulnerability problems. The large number of warheads on each Trident submarine clearly would become unacceptable at levels below those proposed in START and is hardly reassuring at those levels. A smaller bomber force could become a tempting target for small, hard-to-detect Soviet attacks of the sort that were a concern in the 1950s unless we adopt a much more dispersed and better-located bomber basing system than we have ever operated, with provision for postattack operations from a large number of alternative bases.

Regarding the ICBMs, there is little reason to expect mobile systems that require large deployment areas to be more feasible politically or more affordable in the future than those that have figured in the long and futile search for a replacement for silo-based Minuteman. A viable system would have to rely on some form of deceptive basing, probably in combination with defenses employing a preferential protection doctrine to increase their leverage. Since our ICBM force will be smaller than the present one, a relatively low-cost means of achieving the needed characteristics might be to place modernized missiles in some of the existing Minuteman silos, shifting the missiles covertly among the one thousand silos often enough to deny an attacker useful information about their actual locations. If such a basing arrangement were also protected by a preferential defense, a Soviet attack on it would clearly be futile. However these strategic nuclear force issues are resolved, we are unlikely to return to a posture in which an initial Soviet attack would be able to damage enough of our forces to preclude a devastating retaliatory response to an attack if it left us no incentives to observe restraint.

It has long been believed that the use of nuclear weapons is most likely to arise out of conventional war between the United States and the Soviet Union. An attacker seeking to use nuclear weapons for military advantage in such a war while avoiding his own destruction

would have to plan his attacks so as to avoid indiscriminate collateral damage and to retain substantial forces in reserve as a continuing deterrent. To degrade an adversary's strategic nuclear forces to the point at which their retaliatory capability would be appreciably reduced would take repeated attacks over an extended period, supported by a highly capable reconnaissance system. Such uses of nuclear weapons present quite different issues from those of the first-strike paradigm.

Stability, Reassurance, and the Control of Strategic Forces

Growth in the operational effectiveness, protection, and size of the Soviet nuclear forces first eroded the U.S. capability for counterforce attacks in a nuclear response to Soviet aggression and, as U.S. strategic force modernization lagged, ended by eroding confidence in the U.S. ability to deter Soviet attacks at all unless we adopted a policy of immediate and unrestrained launch-on-warning response. Because of the suicidal nature of such a U.S. response, efforts to maintain the credibility of the deterrent have been increasingly directed at playing on Soviet doubts about the U.S. ability to control the level of violence in the event of war. Such a policy is hardly conducive to maintaining control in a war; nor is a limited ability to control an unlimited response a suitable basis for either stability or reassurance.

To reassure while deterring, our nuclear posture must not only project the ability to respond to aggression. It must also project the ability to respond in a manner consistent with our national interests or to withhold responses when it serves our interests to do so, while assuring the ability to respond later. The inability to meet these requirements not only erodes the credibility of deterrence, it also brings deterrence into conflict with the objectives of stability and reassurance.

To reassure, our posture must incorporate measures that go beyond the technical safety of our weapons. It must include institutional arrangements that keep the decision to use nuclear weapons under the control of duly constituted political authorities. Equally important, it must provide for the survival of these authorities, for their access to the information needed in making strategic decisions, and for their ability to communicate orders to our military forces. It is important that such authorities be able to act quickly, but even more so that they be free from the need to act under time pressures created by their own vulnerability, that of other elements of the C³I system, or that of the forces under their command. Attaining a posture that is safe in this broad sense contributes to stability and is essential for resolving

conflicts between deterrence and reassurance. Our failure to meet these requirements has been a principal source of concern about first-strike instability.

C³I vulnerability plays a central role in the pessimism about keeping control of nuclear forces in a crisis or about avoiding a catastrophe after any use of nuclear weapons, however restricted it may be initially. Professor Ashton Carter lists three reasons commonly presented for concern about the effects of attacks on the C³I system itself. "Command system counterforce" might paralyze any response; blunt the effectiveness of retaliatory forces, "defined in military terms"; and defeat "efforts to control nuclear violence."¹⁴ His first two reasons, like most discussion of C³I in nuclear operations, deal with issues within the context of a massive Soviet first strike. His third reason applies primarily to controlling selective nuclear operations. The following discussion considers first the C³I problems as they appear under the assumptions of the first-strike paradigm and then deals with the issues confronting the selective use of nuclear weapons in the course of nonnuclear combat operations.

C³I Vulnerability in the First-Strike Paradigm

Despite the growing strategic force capabilities on both sides that would survive an initial attack, doubts about the survival of C³I have intensified pressures to make irrevocable launch decisions while an attack was in progress and therefore on the basis of early, incomplete, and probably ambiguous information.¹⁵ C³I vulnerability as a reason for adopting a launch-under-attack doctrine implies that we would launch essentially all our ready forces—nonrecallable missiles as well as recallable bombers, and secure SLBMs as well as vulnerable ICBMs—in an attack that would devastate military and civilian targets in the Soviet Union.¹⁶

No mistake could be more tragic than an unnecessary use of nuclear weapons. But in addition to inducing error, a commitment to immediate nuclear response assumes that our decision makers would know all they needed to know about an enemy nuclear attack in the first few minutes after it was launched. At the root of such an assumption is the first-strike paradigm. Only if we assume that an initial Soviet nuclear attack will inevitably use the bulk of their forces against a comprehensive set of U.S. targets can we be indifferent to learning about its actual character before responding. In the future, uncertainty may not only involve the size and targets of an attack, but even the nation launching an SLBM attack.

To assure that no attacker could believe it might prevent response by decapitation, both the United States and the Soviet Union have

engaged in substantial efforts to provide for the survival of the National Command Authorities (NCA) and their C³I connections to the strategic forces. A published assessment by Professor Ashton Carter concludes that, in today's situation, "It is almost impossible to erect an analytic case for the proposition that current U.S. strategic forces can be literally decapitated by a Soviet strike," where "literal decapitation means damage to the command system so severe that it either fails totally to direct retaliation or cannot direct retaliation intense enough to do crippling damage to the Soviet Union."¹⁷

C³I vulnerability has, however, remained a powerful factor in the first-strike paradigm. Carter's assessment, for example, continues, ". . . command system vulnerability, while not rendering retaliatory forces literally useless, might blunt their effectiveness *as defined in military terms*. . . . Doubt about the ability of a damaged command system to direct retaliation that is effective *according to established targeting criteria* is probably the most serious reason to be concerned about C³I vulnerability. . . . A consequent need to fall back upon a ragged assault on urban centers that is both ineffective and unconscionable from the military point of view is what the nuclear command system fears most."¹⁸

Professor Carter's assessment finds that, while literal decapitation is not a serious concern for an alerted C³I system, the ability to coordinate an attack will decline, primarily as the airborne elements lose their capability in the hours following an attack.¹⁹ This assessment suggests that, barring an attack that achieves tactical surprise (of which more below), a substantial capability for coordination would remain for some hours, while airborne elements of the system remained aloft and functioning. In terms of stability, there is a vast difference between preparing to make a decision within hours after a Soviet nuclear attack and a U.S. posture that requires a decision within minutes of sighting missile launches.

Not all the preceding problems limiting the time available to make a coordinated military response are beyond solution. For example, as already noted, the United States and the Soviet Union have each taken pains to assure the survival of its National Command Authorities and it is not at all clear that the kinds of initial Soviet attacks assumed in standard planning could eliminate them or limit their effective survival to a matter of hours. But, before spending large resources to retain indefinitely the ability to execute a massive, well-coordinated counter-military response to a massive attack, we must assess the importance of the kind of coordination assumed as a requirement in the preceding discussion.

Detailed coordination would be necessary to maximize the effectiveness of a postattack response in executing a large attack "defined in military terms," as called for in the Single Integrated Operational Plan (SIOP). Coordination is required by considerations like reallocating surviving weapons in a damaged force among targets of different priorities, taking account of multiple independently targetable reentry vehicle (MIRV) footprint limitations, avoiding fratricide of weapons on the same or neighboring targets, assuring optimal use of aerial tankers, and providing defense suppression for bombers penetrating Soviet air defenses. Without such coordination, the expected damage to the targets, as defined in the SIOP, would decline. The alternative, in the terms attributed to the nuclear command system by Professor Carter, is "a ragged assault on urban centers that is both ineffective and unconscionable from the military point of view."

How compelling a case does the requirement for coordinating SIOP execution make for launching under attack? If full coordination of a retaliatory strike were essential, we might adopt a posture that ensured our ability to achieve it after riding out an attack. But, before accepting the cost of such measures, we must determine how different, in terms of the outcome for either the United States or the USSR, such a "ragged attack" would be from a well-executed attack to "cover a wide target set for direct military effect," where both attacks used thousands of nuclear weapons and the "wide" military target set included war-supporting industry and national command centers.²⁰ Is coordination a question of dotting the *i*'s and crossing the *t*'s or is it vital for deterrence and survival? Long ago, when a U.S. counterforce attack had a reasonable prospect of degrading Soviet retaliation far enough to significantly reduce damage to the United States, there was a connection between performance "from a military point of view" and the national interest. That connection is far from obvious today. Nothing in the public domain serves to establish such a connection. This may not be conclusive, given the sensitivity of military operational plans. Official pronouncements on this score do not, however, inspire confidence that the issue has been adequately examined. The risks associated with a policy relying to some vaguely specified degree on a launch-under-attack doctrine are too serious to pass without intensively assessing at the highest policy levels whether such a doctrine is in the national interest.

The issue raises both technical and strategic questions. At the technical level, could we design a strike plan to make the effectiveness of SIOP execution less dependent on coordination? In analogous cases of large-scale, complex operations, a plan designed for robustness of execution under adverse conditions often suffers only a modest penalty

in effectiveness compared with one that depends on fully coordinated, precise execution. In the case of SIOP execution, the serious risks and political costs of depending on launching under attack require a demonstration that alternative plans capable of being executed with a damaged C³I system would unacceptably reduce the effectiveness of our response before we accept these risks and costs.

At the more fundamental strategic level, it would be necessary to show that the difference in performance against the SIOP target list would make a significant difference in terms of deterrence or protection of the United States if deterrence failed. The unreliability of past predictions about the strategic effectiveness of bombardment campaigns in either mission hardly inspires confidence. In the emerging strategic environment, the burden of proof will rest increasingly on proponents of a hair-trigger posture.

Without convincing demonstrations at both levels, there is no clear case for allocating large resources in an austere budget to preserve indefinitely a capability to meet exacting SIOP coordination criteria after a massive Soviet nuclear attack. We should certainly not allow the requirement for coordination to lead us into adopting a force posture and policies that may compel our decision makers to take imprudent actions in a crisis. Rather, we should opt for a safer posture, one that permits us clearly to abjure reliance on a policy of launching under attack.

C³I as a Factor Limiting the Ability to Conduct Selective Nuclear Operations

The impossibility of protecting national interests in a massive nuclear exchange leads many to the comforting conclusion that deterrence is unshakable and the danger of nuclear destruction has been exorcised. This conclusion is appealing at present, when the possibility of war between the United States and the Soviet Union seems remote. The general outlook could change sharply in an unexpected crisis, however, so long as the Soviet Union retains large conventional and nuclear forces. The task of military strategy in a world containing large military forces is to prepare a posture that restrains potential adversaries from resorting to military force under circumstances we cannot now foresee and to safeguard U.S. national interests if they do. To do this we must think through how military force might be used against us and what kind of response we would need to make in these circumstances. In Albert Wohlstetter's terms, we must fight many "virtual wars" to avoid having to fight a disastrous real one.

To do otherwise would be to stake our future on the impossibility of war, conventional or nuclear. On the contrary, prudence requires

that we consider not only the possibility of war but also what incentives might arise to use nuclear weapons in the course of conventional combat operations between the United States and the Soviet Union (or any other future adversary armed with nuclear weapons). With neither side able to preclude its adversary from making a massive nuclear response to a massive first strike, concerns for national survival would motivate each to direct its attack selectively toward military objectives, keeping both the objectives and the attack discriminate enough to preserve the adversary's incentives for restraint.

History and common sense make clear that motivation is not a guarantee. Governments and individuals make mistakes and do not follow any simple model of rational behavior; plans often go awry. But that is not to say that they ignore the dictates of survival. If the assumption that any use of nuclear weapons is uncontrollable became national policy, it would be a self-fulfilling prophecy with an appalling outcome. Whether or not it will continue to be necessary for the United States to rely on initiating the selective use of nuclear weapons, we must be able to respond selectively to such attacks in order to deter Soviet selective use.

Skepticism among nuclear strategists about the ability to control the use of nuclear weapons often rests on doubts about the ability to distinguish selective from indiscriminate use.²¹ In an extreme form, arguments that it is infeasible to control the use of nuclear weapons assert that there would in fact be no significant difference. Such arguments do not define *selective attacks* in terms of specific military purposes and certainly do not evidence any concern for keeping the level of destruction under control; rather they define the concept in terms of large target categories such as counterforce or the catchall category of "other military targets." They then assume that such attacks would be executed with numbers of weapons and nuclear yields so large that they would, in fact, be insignificantly different from the attacks of the first-strike paradigm. In contrast, selective attacks that might be critically important to the outcome of a conventional war could be orders of magnitude smaller, keeping collateral damage low enough to preserve strong Soviet incentives for restraint.²²

The C³I requirements for selective nuclear operations differ in several respects from those generated by a massive, preplanned response to a massive attack. Whether or not the massive attack requires detailed coordination, the selective use of nuclear weapons would have to be controlled in detail by political as well as military considerations in order to have the desired military effect while deterring escalation to higher levels of violence. Although a functioning C³I system is essential to keep selective nuclear operations under control, its problems differ

from those currently receiving emphasis; in some respects they are less difficult, but in others more demanding.

The assumed difficulty of distinguishing selective and unrestrained attacks is often based on the assumptions that the assessment must be made immediately and with a disabled C³I system. Neither is persuasive, for reasons already discussed. It would not take an elaborate C³I system to make it obvious that a selective and discriminate attack had left the bulk of the country unharmed. To destroy this level of command and control capability, an attack against C³I targets would have to have been so comprehensive that it could hardly be considered selective or discriminate. Moreover, decapitation of an adversary would be self-defeating in an attempt to fight while keeping control.²³

On the other hand, impairing an adversary's ability to get and use military information would be a matter of the greatest importance in either conventional or selective nuclear operations. Selective attacks to degrade an adversary's military effectiveness by destroying vulnerable links in his C³I system would receive high priority. Maintaining the viability of the U.S. C³I system (as well as our strategic forces) through a protracted conventional war, especially one punctuated by the selective use of nuclear weapons, may expose some vulnerabilities overlooked in assessing a command system only for managing massive attacks. Exploitation of opportunities for decisive use of small numbers of nuclear weapons would also place heavy demands on the ad hoc ability to locate and identify targets for them. And, while our posture should reduce the urgency of a massive nuclear response, the selective use of nuclear weapons might require an ability to react quickly and accurately to targets of opportunity. Such selective operations impose requirements for wartime reconnaissance, communications, analysis, and planning. It also calls for wartime tactical warning from systems that may be attacked because they are dual capable. These demands on the command system are more stringent in some ways than those of executing a massive, preplanned attack. It also requires protection against conventional or limited nuclear attacks that might not necessarily incapacitate the command system immediately, but would reduce its capabilities over time. An example is the dependence of our airborne and space-based C³I systems on small numbers of complex ground facilities without which these capabilities would decline over time.²⁴

Finally, in dismissing C³I system vulnerability as a dominant concern in keeping control of selective nuclear operations, Professor Carter argues that the inevitability of "errors, misunderstandings, and confusions" inherent in war would be the primary obstacle at levels "well below all-out exchanges," even with the command system intact.²⁵ Mistakes on the part of an attacker clearly diminish the effectiveness

of his attack. But whether mistakes, uncertainty, and confusion on either side are destabilizing and how seriously so depends as well on the strength of incentives to keep control. This, in turn, depends on comparing the consequences of incorrectly assuming that restraint will continue with those of making the opposite error. Our own doctrine and posture, at least, should minimize the chances of losing control through errors.

Active Defenses in a Renovated Strategic Architecture

If improved relations with the Soviet Union lead to levels of nuclear offensive forces far below those being negotiated in START, this will open the possibility of moving toward a posture of combined strategic offense and defense in which the destructive capacity of the remaining nuclear weapons could be kept to levels far below those now associated with nuclear war. As suggested earlier, however, a drastic reduction in nuclear offensive forces might create or intensify concerns about stability. These problems could be alleviated by defenses that offered protection against small, short-warning attacks on vulnerable elements of the reduced offensive forces or on critical elements of the C³I system that would be vulnerable before the United States made the transition to a wartime posture. Such a mission would be an important element in moving toward a posture that is free from pressure to launch under attack. At the same time, defenses could serve roles now under discussion for limited defense deployments: protection against attacks by small nuclear forces resulting from the proliferation of weapons and advanced delivery systems or against accidental or unauthorized launches of some Soviet forces. These objectives would require both air and ballistic missile defenses.

Technological advances made in the Strategic Defense Initiative indicate that many of the doubts about the technical feasibility and affordability of ballistic missile defenses for such purposes have been resolved or are resolvable. But the deployment of ballistic missile defenses for these purposes faces a number of problems. Soviet opposition is the primary obstacle. The Soviet objectives appear to be to avoid a technological competition with the United States in an area of competitive disadvantage for them and to avoid new claims on their scarce resources. The introduction of ballistic missile defenses, a new element in the nuclear balance, also raises concerns about the preservation of stability during a buildup of defenses. Both sets of concerns call for care in designing the transition.

To deal with some of these concerns the United States might seek Soviet agreement to a plan for deploying defenses in specified stages.

The first step would authorize deployment of a modest level of defenses while offensive forces were still at START levels. This would avoid threatening the Soviet Union with nuclear inferiority or imposing excessive pressure on their technological capacity or defense budget (or our own, for that matter). The initial deployment could, however, be set at a level adequate to deal with the missions for defenses of limited size discussed above. Following a period spent accumulating technical and operational experience with defenses, a second step could increase strategic defenses to a more substantial level, but still not such as to bring the strategic balance into question by either side at START offensive force levels. The final step would be a reduction in offensive forces to a level just sufficient to distinguish the United States and the Soviet Union from other nuclear powers, but one low enough so that the defenses now provided significant protection.

The present Soviet position is clearly opposed even to the first step in this proposed process. Current stresses on the Soviet leadership do not bode well for our chances of inducing them soon to accept a radical change in this policy. The primary negotiating leverage available to the United States for gaining Soviet agreement to such a plan is to convey to Soviet leaders that their opposition will not halt the development in the West of the relevant technologies, which will go ahead not only within the SDI program, but also in other space-related applications not subject to the restrictions of the ABM Treaty. We should also remind Soviet leaders that, although the ABM Treaty binds the United States and the Soviet Union, other countries not bound by it increasingly will have both the means and the motives to deploy ballistic missile defenses as missiles capable of carrying weapons of mass destruction continue to spread. Also, as discussed, if in the more distant future Japan and Germany should desire greater control over their own security, it is far preferable from every point of view that they seek it through defenses rather than nuclear offensive weapons. If, as seems likely, the current climate of relations leads to drastic reductions in U.S. and Soviet offensive weapons, this may become a reasonable goal for Japan and Germany.

There is a strong reason, however, to make clear during the START negotiations that reductions in offensive forces substantially below the START levels will require prior deployment of defenses. Almost forty years ago, before the issue of defense against nuclear attack had acquired its present ideological freight, J. Robert Oppenheimer stated the case:

A more effective defense could even be of great relevance should the time come for serious discussion of the regulation of armaments. There

will have been by then a vast accumulation of materials for atomic weapons, and a troublesome margin of uncertainty with regard to its accounting—very troublesome indeed if we still live with vestiges of the suspicion, the hostility and the secretiveness of the world of today. . . . Defense and regulation may thus be necessary complements. And here, too, all that we do effectively to contribute to our own immunity will be helpful in giving us some measure of an increased freedom of action.²⁶

Notes

1. *Stability* is far from a term of precision in discussions of international relations. It is used interchangeably to mean either the absence of change or change of a desirable sort, i.e. noncoercive, nonviolent change consistent with our political objectives that maintains the international system in a dynamic equilibrium.

2. Michael Howard, "Deterrence, Consensus and Reassurance in the Defence of Europe," in *Defence and Consensus: The Domestic Aspects of Western Security, Part III*, Adelphi Paper no. 184 (London: International Institute for Strategic Studies, 1983), pp. 17–26.

3. Dominique Moïsi, "Domestic Priorities and the Demands of Alliance: A European Perspective," in *Defence and Consensus*, pp. 12–16. See especially p. 13 for a succinct European view of the problem.

4. Michael Howard, "Deterrence, Consensus and Reassurance," p. 18.

5. Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, vol. 37, no. 2 (January 1959), pp. 211–34. The concept of a *first strike* later acquired a connotation quite different from the first-strike/second-strike distinction in this article and in Wohlstetter's earlier work (classified at the time). As used in the *Foreign Affairs* article, the distinction was employed to establish the need to ensure the survivability of U.S. strategic offensive forces so as to permit responses to aggression either before or after an enemy attack on them. The later development of the "first-strike instability" paradigm focused on the difference between striking first and striking second in the context of a massive attack using the bulk of either side's nuclear inventory against a comprehensive set of civil and military targets.

6. *Discriminate Deterrence*, Report of the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, January 1988), pp. 33–34.

7. Michael Howard, "Deterrence, Consensus and Reassurance," pp. 17–26. On the coherence of the strategy, he says, "It is no longer only a minority of anti-militarist intelligentsia who question the validity and credibility of a deterrent posture which would, if activated, destroy everything it is concerned to defend" (p. 22). See also comments on Howard's paper by Samuel P. Huntington, "Broadening the Strategic Focus: Comments on Michael Howard's Paper," in *Defence and Consensus*, pp. 27–32.

8. Michael Howard, "Deterrence, Consensus and Reassurance," p. 22.

9. Professor Huntington offered German acquisition of nuclear weapons as an alternative solution. Recent reactions to German unification give an inkling of the acute sensitivities that would be aroused by such a "solution."

10. Glenn A. Kent, Randall J. DeValk, and David E. Thaler, *A Calculus of First-Strike Stability (A Criterion for Evaluating Strategic Forces)*, RAND Note N-2526-AF (Santa Monica, Calif.: RAND, June 1988), p. 1.

11. *Ibid.*, p. 1.

12. Caspar W. Weinberger, Secretary of Defense, *Annual Report to the Congress, Fiscal Year 1985* (Washington: U.S. Department of Defense, February 1, 1984), pp. 195-96, emphasis added.

13. For the United States, these include submarine-launched ballistic missiles (SLBMs) at sea and air-launched cruise missiles (ALCMs) on alert bombers. A substantial but smaller fraction of the Soviet force also consists of such systems. In the future, bomber-carried weapons are expected to increase as a fraction of the force on both sides, and the Soviet Union is expected to deploy substantial numbers of warheads on mobile ICBMs. Such projections depend on the outcome of arms reduction negotiations, of course. While submarines in port and nonalert bombers are vulnerable to attack, they do not contribute to instability under the first-strike paradigm because, unlike silo-based ICBMs, they will be destroyed on both sides in the assumed prompt exchange, regardless of which side strikes first.

14. Ashton B. Carter, "Assessing Command System Vulnerability," in *Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington: Brookings Institution, 1987), pp. 556-57. The extended quotes from this article are reprinted by permission.

15. A launch on warning would involve launching offensive forces, including nonrecallable missiles as well as recallable bombers, on the basis of electronic signals that Soviet missiles had been launched. For Soviet launches at intercontinental ranges, the time from launch to impact would be about thirty minutes. If the Soviet attack employed ballistic missiles launched from submarines off our coasts, the time from launch to missile impact could be on the order of twelve minutes—the total time available for detecting the launch, transmitting the warning signals, interpreting and assessing them, communicating the data to responsible authorities, reaching a decision, transmitting a launch order, and executing it. To avoid the possibility of responding to a false signal, the variant of launch on warning called launching under attack would defer a decision to respond until after an initial nuclear detonation, but would still attempt to launch before the main body of the Soviet nuclear attack reached its targets. A major motive for substituting launch under attack for launch on warning has been the desire to evade the costs and political difficulties of proposed solutions to the problem of ICBM vulnerability. To this end, for example, the Scowcroft Commission argued in *Report of the President's Commission on Strategic Forces* (Washington: U.S. Department of Defense, April 1983), pp. 7-8, that the vulnerability of bombers to short-warning SLBM attack and silo-based ICBMs to ICBM attack synergistically face the Soviet attack planner with a dilemma. This reasoning held that an attack timed for

simultaneous impact of Soviet ICBMs and SLBMs would allow a fail-safe launch of the recallable alert bombers, while an attack simultaneously launching close-in Soviet SLBMs against U.S. bombers and Soviet ICBMs against U.S. ICBM silos would provide twenty minutes or so of unambiguous warning after SLBM detonations on bomber bases in which to launch U.S. ICBMs from under the enroute Soviet ICBM attack. (The commission distinguished this from launch under attack, calling it a *launch after attack*.) In the latter attack, however, the proposed U.S. launch doctrine would fail to ensure the ability to order any response if the initial Soviet SLBM attack were able to exploit vulnerabilities in critical U.S. C³I system nodes, but it would still require a U.S. decision to launch on warning before the character of the main attack could be assessed and alternative responses evaluated.

16. Where permissive action links (PALs) have been installed, making it physically impossible to use nuclear weapons without authorization, they simultaneously increased the operational flexibility available to military commanders, but intensified the concerns of these commanders about the survival of the National Command Authorities and their links to the forces.

17. Carter, "Assessing Command System Vulnerability," p. 607.

18. Ibid., p. 557, emphasis added.

19. Ibid., p. 609. Carter's account is as follows: "In a major Soviet attack that finds the United States fully alerted, American authorities will find their chances of conducting the large, coherent strikes against Soviet military targets called for in some retaliatory options to be greatest in the first few hours after the attack and to become increasingly uncertain thereafter . . . since so much depends on a few hours of airborne operation of aircraft . . . even the availability of surviving command authority. Further pressure to act soon might come from fear of further Soviet attack and from the knowledge that tactical warning might not be available the second time."

20. Ibid., p. 557.

21. The notion of selective nuclear operations appears to strike the majority of strategists in the field as inherently implausible, a view consistent with the dominance of the first-strike paradigm. Among those who have proposed planning for such operations (largely Americans), many appear to have done so not because they were confident that such operations could reliably be kept under control or even that they would clearly be in the U.S. interest if they could be controlled, but as a kind of bluff in the search for a credible nuclear threat under the rubric of NATO's flexible response, as the credibility of a massive U.S. nuclear response to a conventional Soviet attack eroded.

22. Albert Wohlstetter and Richard Brody, "Continuing Control as a Requirement for Deterring," in *Managing Nuclear Operations*, pp. 142-96. See especially pp. 157-63 for a critique of attempts to prove the infeasibility of keeping nuclear use under control, as well as examples of selective nuclear attacks with crucial military effects.

23. Professor Carter's view of the differences is as follows: "To question the controllability of nuclear operations on the ground of command system vulnerability, however, risks a serious confusion of scale: disruption of the

national command structure (especially when it has been alerted by prior tensions) requires . . . a large homeland attack involving the national capital. . . . The strategic command system can be thought of as two distinct systems. One aspires to the virtuosity and control called for by limited operations and 'protracted nuclear war,' but by definition need not survive unlimited attack. The second must survive the most determined attack and then direct crude retaliation or—much more demanding—a comprehensive strike of immediate military effect." "Assessing Command System Vulnerability," p. 558.

24. See Wohlstetter and Brody, "Continuing Control," pp. 190–96, for a fuller treatment of this issue.

25. Carter, "Assessing Command System Vulnerability," pp. 557–58, and Carter, "Sources of Error and Uncertainty," in *Managing Nuclear Operations*, pp. 611–39.

26. J. Robert Oppenheimer, "Atomic Weapons and American Policy," in J. Robert Oppenheimer, *The Open Mind* (New York: Simon and Schuster, 1963), p. 76. From a lecture to the Council on Foreign Relations on February 17, 1953. Originally published in 1955.

12

Present Trends and Future Consequences in the Asia-Pacific Region

Paul D. Wolfowitz

Let's Consider the Real World

It was my extreme good fortune that Albert Wohlstetter came to teach at the University of Chicago just as I was starting there.

For me, having majored in mathematics and chemistry, graduate study in political science was an experiment motivated by a powerful attraction to the subject matter. But I was so ignorant about the formal discipline of political science that I had only the slightest notion of Albert's reputation and his remarkable achievements when I first met him at a student-faculty reception in the fall of 1965. Fortunately for me, Albert had a better idea of who I was—or more precisely who my father was—having studied mathematics with him and Abraham Wald as a graduate student at Columbia University. When Albert discovered that I had a math background myself, he took a great interest in me as a student, for which I am permanently in his debt.

Albert taught me most of what is important to know in the field of strategic studies and a great deal that is less tangible and harder to specify about the relation between research and practical policy and about the right way to go about analyzing problems. Most of all, he set an example for me of what is properly called a serious person: someone who pursues the truth about important questions and works to see that those ideas are put into practice.

One of the phrases I remember Albert using often in classes and seminars was the line: "Let's take a hypothetical example—let's consider the real world." This sense of realism stood out at a time when many so-called strategists delighted in

This chapter was adapted from a speech that Ambassador Wolfowitz gave at the *International Herald Tribune* Centennial Conference in Singapore on November 11, 1987.

spinning abstract theories about strategic relationships between Country A and Country B. Despite his theoretical bent—indeed, perhaps because he was not overawed by theoretical or mathematical constraints—Albert understood the limitations of pure theory, the need for hard work to unearth the facts, and the importance and challenge of drawing practical conclusions from the combination of facts and theory.

When I first met Albert, "defense intellectuals" were still very much in vogue, basking in the last glow of the Kennedy era and the supposed revolution in defense planning that systems analysis had wrought at the Pentagon. But, with the intensification of the Vietnam War, too many of them retreated to safer disciplines or even completely reversed positions they had advocated only a few years before. Albert, however, was as willing to take an unpopular position as a popular one, if he believed it was right. His moral compass over the years has been an extraordinarily steady one and an inspiration to all who know him.

Certainly Roberta deserves much of the credit for that moral steadiness, as well as for many of Albert's intellectual achievements. Indeed, as distinctive as each of their individual achievements has been, one always sees their influence on each other. It has been a privilege to be associated with this remarkable partnership, to witness their extraordinary depth of common purpose, and to share in their generous friendship.

* * *

The United States is fortunate to be part of the increasingly important Asia-Pacific region. Although we began as a country on the eastern coast of North America, it did not take us long to acquire a western coast, once we had achieved independence. In 1803, the Louisiana Purchase brought us our first Pacific coastline, and thirty years later the Treaty of Amity and Commerce with Thailand brought us our first formal agreement with an Asian nation. Consistent with the more general focus of nineteenth century American interest in Asia, that treaty concerned itself primarily with trade. The proposal for a formal treaty of alliance made by Thailand two decades later through the American envoy in Bangkok, Townsend Harris, was rejected by the United States.

U.S. relations with its Pacific neighbors during the nineteenth century could hardly be called close. For example, a survey of editions of the *International Herald Tribune* published in 1887 and the first half of 1888 turned up no coverage of the Asia-Pacific region. Indeed, one might say the region was notable by its absence. That period was marked by some of the most disgraceful and short-sighted legislation in American history—the series of laws that sought, for some time quite successfully, to exclude Asian immigrants from the United States. There were many

who opposed such policies, including President Theodore Roosevelt. During his administration, Justice Brewer, in an opinion on a 1904 Supreme Court case, spoke of the enormous benefits that had come from Chinese students studying at American universities, from Chinese laborers helping to build American railroads, and from political and commercial relationships with China:

If all this be reversed and the most populous nation of earth becomes the great antagonist of this republic, the careful student of history will recall the words of Scripture, "They have sown the wind and they shall reap the whirlwind." And for cause of such antagonism, one need look no further than the treatment accorded during the last twenty years by this country to the people of that nation.

But that was a dissenting opinion. John Hay advised President Roosevelt in a memo that same year: "Congress has done its work so well that even Confucius could not become an American."

Fortunately, today—even though the majority of Americans still trace their origins across the Atlantic and the United States has strong and powerful ties to Europe—we have become as well a Pacific nation in a meaningful sense.

That change is reflected in many things, including the area of immigration. In June 1986 the valedictorian of the graduating class of the U.S. Air Force Academy was a former refugee from Vietnam. More than half of all new immigrants to the United States come from Asia and more than four million Americans trace their origins across the Pacific. Fourteen percent of the entering class at Harvard in 1986, and an astonishing 20 percent at the Massachusetts Institute of Technology, were Asian-Americans.

Indeed, during the last decade so many American officials have travelled to Asia, so many have spoken of the importance of the Pacific region, that occasionally it even appeared as though some of these officials might be in danger of underestimating important U.S. ties to Europe.

This increased attention to the Pacific in part reflects the weight of those new Asian immigrants. It also reflects a more fundamental shift of the American population toward the West Coast. But what it reflects most of all is the extraordinary success of the Asia-Pacific region in recent years and its growing economic importance.

The Triumph of Asian Realism

At the beginning of the present century, Elihu Root, the American secretary of state at the time, spoke about the Pacific region in terms

that were to prove truly prophetic. "The Mediterranean," said Root, "is the ocean of the past. The Atlantic is the ocean of the present. The Pacific is the ocean of the future."

That prediction has come true today, less than one hundred years later, to a degree that probably would have surprised Root himself. The spectacular economic growth of the nations of this region, first registered by Japan and now joined by so many others, has begun to give this region a weight in world affairs that is somewhat proportionate to its enormous share of the earth's population. Predicting the future is a hazardous business at best, but certainly the present trends of economic growth suggest that the Asia-Pacific region will be even more important by the end of the century than it is today.

With the noteworthy exceptions of Indochina and North Korea, East Asia has benefited from a period of unusual stability and a remarkable increase in prosperity. In the first instance, that record is due to astute leadership, whether in Singapore, in Indonesia, in Thailand, in South Korea, or, more recently, in the People's Republic of China. Japan, of course, has had an extraordinarily successful combination of government and business leadership that has enabled the Japanese people to create an economic superpower.

The amazing economic record of our Pacific neighbors has had an important impact on the United States. At the beginning of the 1980s, our total trade with the Asia-Pacific region surpassed our trade with Europe for the first time, and the gap has been widening ever since. Our trade deficit with this region has also been widening, which demonstrates that even success brings problems. But the economic growth of the Pacific region has basically been good for the United States and has helped us grow as well.

Was the current great importance of the Pacific region a kind of historical inevitability that could easily have been predicted by others? I hardly think so. It has always been apparent that this part of the world contains a large share of the world's population, but large numbers of people do not translate automatically into economic strength or importance.

It is also true that these large East Asian populations are heirs of some of the world's most impressive cultures and oldest traditions of learning. But impressive roots do not necessarily mean that the latter-day plant will flourish. Indeed, a hundred years ago one would probably have heard all of that great tradition described as part of the heavy hand of the past obstructing modern progress in Asia.

Certainly one of the traits that was said to be most characteristic of Asia and the Pacific one hundred years ago was fatalism. This was the part of the world where long-suffering people meekly awaited the

ordinations of superhuman and supernatural forces. That era, if it ever existed, is certainly dead now. Modern Asian leaders see destiny not as written in the stars, but as subject to their own actions. In this part of the world, perhaps more than any other, people see the present as better than the past, and they expect the future to be better than the present. That is an outlook that breeds self-confidence, self-assurance, hard work, and a desire to master one's own destiny.

One might be tempted to say that Asians today have a quality that is said to characterize Americans: optimism, stemming in part from idealism. But I hesitate to do so, perhaps in part because that great European thinker, Raymond Aron, has called optimism a sure sign of an error in thinking. The attitude that characterizes Asia today is not the ebullience of optimism. Indeed, if there are two things that seem to have contributed most to Asia's modern-day success, they are the attitudes of realism and self-reliance.

Will the Asia-Pacific region continue to prosper and grow in importance during the decade or so remaining in this century, as it has generally done since the end of World War II? Certainly present trends favor such a course, but whether it will be realized depends on how the people of the region and their leaders respond to the challenges that confront us. There are four such challenges that deserve special mention: the challenge of security, the challenge of the world economy, the challenge of building political institutions, and the challenge of bringing the Soviet Union into a responsible relationship with the region.

The Security Challenge

I discuss the problem of security first, even though it is clear that we need much more than military strength to address the problems of the Asia-Pacific region and to continue the successful path that has been charted during recent decades, and even though East Asia is at present a relatively peaceful and stable part of the world.

Even though stability and security are not the only things that matter, without them it is virtually impossible to achieve the other things that are important. And while the region has enjoyed a period of comparative tranquility during the 1980s, one of the greatest challenges in maintaining a successful security policy is that its very success may undermine the political rationale that sustains it, that people may come to take their situation for granted and abandon the efforts required to preserve stability.

It would be a great mistake, however, to take stability in the Asia-Pacific region for granted. If one includes India, the seven largest

military forces in the world operate in this region.¹ Every one of those armies has been at war in Asia at some time since World War II. Practically every pair of neighbors in this part of the world has some historical, ethnic, or territorial basis for conflict. It will take continued skillful diplomacy to preserve peace and stability. But that diplomacy also needs to be supported by adequate strength in the hands of those who seek to preserve peace.

One might wish that stability in the region could rest on a more benign basis than deterrence and a balance of opposing forces, but wishing will not make it so. Certainly until the year 2000, and probably well beyond, U.S. military strength will continue to play a crucial balancing role here. Even those Asian statesmen who are most anxious to eliminate intervention by the big powers in the affairs of the smaller countries—one might say those leaders above all—recognize that to achieve this goal in practice under present conditions requires the presence of the United States.

There are two realities about the American military presence that Asian leaders also need to recognize, one physical and the other political. The physical reality is that the United States is separated by ten thousand miles of ocean from its "neighbors" on the western side of the Pacific. Modern transportation and communications have done much to reduce the significance of that distance, but they cannot change the fact that to have the military presence needed, the United States must have access to facilities of its allies in this part of the world. Those who provide such assistance are not merely helping us and helping themselves; they also are contributing to the stability of the entire region.

The political reality that must be kept in mind is perhaps a product of that physical distance. The historical tendency for the United States is to avoid overinvolvement in the Asia-Pacific region, to retreat behind all that ocean, and to seek to isolate itself from developments abroad. That danger may seem remote now, after the reassertion of America's role in the region during the 1980s. For reasons explained above, the causes for the increased American attention to the Pacific are fundamental and are not likely to be reversed. The fact remains, however, that in the 1930s, in the 1950s, and again in the 1970s the United States attempted to withdraw from its responsibilities. The first two times, disastrous wars followed. The most recent episode ended before it had serious destabilizing consequences, although a tremor was felt in Northeast Asia from the U.S. decision, later reversed, to withdraw troops from Korea.

This history should be a lesson to Americans about the importance of maintaining a steady course. It should also be a reminder to our

friends that American involvement should not be taken for granted as something that we will force on unwilling partners. American thinking about its security role will inevitably be affected by consensus, or lack thereof, with its friends in the region. If too many were to follow the example of New Zealand in departing from that consensus, it could affect the political will of Americans. If countries wish to leap into the unknown, abandoning a system of deterrence that has worked well in the past and pursuing some ill-defined and untested alternative, that is a privilege of sovereign nations. But, in doing so, they should not nurture the illusion that the world will remain unchanged, that all the benefits of the status quo can continue to be enjoyed when one of its underlying pillars is removed.

Thanks in large measure to the willingness of the United States to shoulder its responsibilities, the Asia-Pacific region enjoys a reasonably stable balance of power and freedom from international conflicts. As a result, the threat to security in the region tends more to come from a different quarter: internal instability. Internal threats are far more complex and generally more difficult to deal with than external threats of aggression. Yet many Asian nations have impressive track records of doing so successfully; in all cases that success has resulted from a skillful use of political and economic measures, in addition to military ones.

The most active threat to the security of the region today comes from the communist insurgency in the Philippines. A communist victory there would be a serious setback for the United States and would have destabilizing consequences for many of the countries of the area. But the Philippine people are the ones who would pay the highest price. This century has seen enough of such bloody attempts to remake societies, attempts that fail even to bring the economic progress they promise. There is no need to have to learn from yet another. And the Philippine people deserve better, particularly after the inspiring example they have given of dedication to democracy and peaceful change.

The Philippine nation should be able to triumph. The economy has begun to improve, one of the most important vital signs for a healthy counterinsurgency effort. Yet, just at the moment when unity is essential, that unity has been strained. The struggle to maintain that unity is primarily a Filipino struggle, yet even an outsider is entitled to question the sincerity of those who proclaim their opposition to communism but who act to undermine the very unity that is essential to meet the communist danger; or to question the wisdom of those who proclaim their dedication to democracy but who speak as though the danger to democracy in the Philippines comes from the United States.

The Economic Challenge

It is in the economic area that the Asia-Pacific region has made the most breathtaking progress in recent years, but it is also from that direction that the most serious challenge to the continued progress of the region comes. A current manifestation of this economic challenge is the persistence of major imbalances in the world trading system.

One contributing factor is the U.S. federal budget deficit. There now seems to be a clear consensus in the United States that something must be done to reduce further our large deficit if our trade accounts are to be brought into balance. Although there are weighty differences of opinion on how best to do this, serious efforts are underway in Washington to find solutions.

If it is clear that the United States must reduce its dependence on importing more than it exports, our trading partners in the Asia-Pacific region face an equally formidable task of reducing their heavy dependence on exports to the U.S. market. The impressive economic performance of many Asian countries in the 1980s has been fueled in large measure by the growth of the American economy and by the disproportionate growth in U.S. imports. If there is to be adjustment—and it seems there must—it will have to take place on both sides of the Pacific and indeed throughout the world economy. That adjustment will not be painless, but the sooner it begins to happen the more gradual and less painful it can be.

I will leave it to others to suggest what form that adjustment should take, but there is one form that it should not take. Creating new artificial barriers to trade by protectionist legislation is a recipe for certain catastrophe. We do not need a latter-day version of the Hawley-Smoot Tariff Act of 1930 that disastrously deepened and prolonged the Great Depression. Whatever adjustments each of us make, we must not deprive ourselves or others of the enormous benefits of trade that have been the cornerstone of the modern-day prosperity of this region.

Indeed, it is no exaggeration to say that the peace and stability of this region, as well as its prosperity, depend on our avoiding the kinds of disastrous trade wars that characterized the 1930s. When Prime Minister Lee of Singapore spoke before a joint session of the U.S. Congress in 1985, he reminded his listeners of the social upheavals and international conflicts that were triggered by the economic misery of the 1930s and warned that ill-considered restrictions on market access today could cause corresponding dislocations and equally disastrous results. Despite all the well-justified talk of an economic miracle in Asia, for millions of Asia's people that miracle has lifted them only barely above the poverty level. The region's high economic growth

rates have brought an impressive level of stability, but in the process they have become almost essential for continued stability. Even a substantial slowdown in growth would have profound effects in the region. The consequences of a prolonged decline would be grave indeed.

Fortunately, most of the talk of protectionism in the United States today is so far just talk, not action. The United States remains one of the most open economies in the world today, and that is healthy for both the United States and its trading partners. The American people as a whole have so far shown more sense about trade matters than the individual special interests and their representatives.

My confidence that protectionist measures will not become law in the United States would be much greater, however, if our trading partners in Asia would do more to remove the barriers to trade that so many of them use to protect important sectors of their own economies from fair competition. With the noteworthy exceptions of Singapore and Hong Kong, no Asian market is as open as that of the United States. The best way for Asian countries to aid the administration in fighting protectionism in the United States would be by reducing their own protectionist practices—and they would increase their own economic efficiency in the process. Certainly Singapore and Hong Kong have not been hurt by their unusually open trading practices.

The Challenge of Building Political Institutions

On probably no question are there greater divergences of opinion on the two sides of the Pacific than on the subject of domestic politics. The American Constitution sought to maximize individual freedom by dividing the principal powers of the government among separate and competing branches so that no one group or individual could wield inordinate power over others. The men who wrote the Constitution wanted a government that would be effective enough to protect the independence that had been won with such a struggle from Great Britain, but only barely effective enough. They feared that a government stronger than that could tyrannize the people and deprive them of the liberties that are their "unalienable rights."

Americans relish the sometimes boisterous debate of an uninhibited political process. We thrive on the sharp expression of conflicting points of view that to us is the hallmark of democracy. It seems only a truism to say that these qualities are not the hallmarks of politics in most Asian countries. Yet Asia is not without its own political successes, most notably in the area of leadership. The stability and economic success of many Asian countries is in considerable measure

attributable to enlightened and courageous leadership, frequently over sustained periods. I suppose an Asian would say that the test of democracy is more in the results—in whether it produces leaders that serve the people's interests—than in the process by which those leaders are chosen. In fact, it is not difficult to get Asians to speak critically of American democracy as too turbulent, as tending to generate conflict rather than resolve it, as being too responsive to public opinion at the expense of effectiveness.

This may seem to be another manifestation of the difference between Asian realism and American idealism. Certainly the American outlook is based on a commitment to human rights as the most basic purpose of government. The Constitution is, however, a document of profound realism as well as idealism. Americans believe it is no accident that their system of government has lasted so long and brought such prosperity to its people. By permitting the creative talents of the American people to develop untrammelled, the American system of government has played a major role—some would say *the* major role—in our economic success. By finding a peaceful and unquestioned solution to the problem of political succession—probably the most sensitive question that any political system faces—the American people have enjoyed a history of unusual domestic political stability. And by adopting “consent of the governed” as the fundamental principle of legitimacy, the American political system not only seeks to achieve an important ideal, but also to implement what may be the only realistic principle of government for a modern technological society.

Tradition receives great respect throughout Asia, and deservedly so. But traditional loyalties and traditional allegiances become increasingly weak as societies progress economically. People who are taught to make major decisions in the operation of the economy will simply not be prepared to relinquish all that responsibility and submit passively to major decisions imposed on them when it comes to politics. As the numbers of such people grow, traditional forms of governance must change to accommodate them—or else become brutal in order to suppress them.

This principle is as true in Asia today as it has been in Europe and North America. It is probably the major factor behind the impressive political changes in the Republic of Korea. The leaders of that country are to be commended for seeing the need for progress and acting to accommodate it. Change that is too sudden can bring instability; but change that is too long postponed can also bring instability. It is far better that such change should come gradually, steadily, and peacefully. That is why I believe that, despite our very different starting points, Asian realism and American idealism will find important points of

convergence in the political sphere as well as in the security and economic spheres.

The divergence between our respective outlooks is evident in another area: the question of freedom of the press. Here, too, many Asians tend to be critical of the strong—perhaps they would say extreme—emphasis that we place on freedom of the press. The difference here is historical as well as philosophical. Many of the nations of Asia, for all their undoubted successes, still have recent memories of violent ethnic, religious, or ideological conflicts; some may still be torn by such conflicts. The scars are simply too recent and the sense of vulnerability is too deep for it to be otherwise. When memories of such violence are fresh, the premium placed on stability is high.

This is an understandable kind of realism, but here too the realities of technology and modern economic conditions intrude. The free flow of information is not merely a desirable luxury that can be dispensed with when necessity demands; it is an essential requirement for an efficiently functioning modern economy. I believe Asian nations will increasingly find there is a high practical cost attached to censorship and other constraints on the free flow of information.

The Challenge of Diplomacy

The final challenge to be discussed is one that the Asia-Pacific region faces as we near the end of the century, a challenge that may also present a new opportunity, the challenge of dealing with the Soviet Union.

The Soviet Union is unquestionably a Pacific nation as well as a European one. But for too long it has relied on military power as the source of its influence in this region and around the globe. Worldwide developments have demonstrated the increasing futility of that approach.

No part of the world has more tragic examples of the terrible cost of communism than Asia. No area has more graphic examples of the economic stagnation and failure that communist systems have brought. And no region has more vivid examples of the success that results when individuals are free to benefit from their own energy and initiative.

One of the dominant trends of the past decade has been the recognition that Marxism, and particularly the Soviet version of Leninist centralism, has failed to answer the need for economic growth. It is now widely accepted that the engine of development and growth is individual entrepreneurship in a free market environment.

Important changes are taking place in the Soviet Union itself. It is high drama and it has properly captured the world's attention, but it is important to remember how little we know about what will really

happen. It is too early to say what are the full nature and extent of the changes that Mikhail Gorbachev has set in motion. Beyond that, it is still far from clear whether the views that prevail will be those of reform or authoritarianism. And finally it is far from certain whether the ultimate result of these changes—if they do succeed in reinvigorating the Soviet economy—will be to bring the Soviet Union into a more peaceful relationship with the other nations of the world or to provide new resources for military power. The picture is one of fundamental uncertainty. Only one thing is certain—fundamental issues of great importance for the future are being debated in the Soviet Union.

It is perhaps no accident that at this very time the Soviet Union seems to be noticing that a great deal has changed in the Asia-Pacific region while its attention was elsewhere. Mr. Gorbachev's 1986 speech in Vladivostok is the most prominent exposition to date of this increased Soviet interest in asserting its role in the region. We have also witnessed an intensification of Soviet diplomatic activity in the region, including the first visit by a Soviet foreign minister to Southeast Asia in more than twenty years.

The other nations of the Pacific—on both sides of that great ocean—would welcome the Soviet Union as a constructive partner in building an even more secure and prosperous future for the people of the region. Throughout the region, the reaction to the Soviet quest for a new role seems to be uniform, with only minor variations: a new Soviet role would be welcome, but it will be judged by actions, not words. The problems of Asia will not be solved by empty declarations. But they can be solved by constructive cooperation.

So far, however, what we have seen in Asia are mostly words, not actions. The agreement to eliminate intermediate-range nuclear missiles is an important step forward that brings benefits to Asia as well as to Europe. Soviet withdrawal of its troops from Afghanistan is another step. But what the region needs even more are solutions to the problems of Afghanistan, Cambodia, and Korea that continue to continue to cast a cloud over the stability and prosperity of this part of the world. A constructive Soviet role, for example, that encouraged North Korea to reduce tensions with the South could be an important factor in bringing peace to the principal area of the globe where vestiges of cold war confrontation remain.

Conclusion

Much of the work of Albert and Roberta Wohlstetter has focused on U.S. security policy worldwide and is as relevant to the concerns of the Asia-Pacific region as it is to Europe. To cite but a few examples,

their seminal work on ambiguous warning and repeatable responses, on the central role of discriminate attack capabilities in deterrence, on the importance of maintaining control over military operations—even those with nuclear weapons—throughout the course of a war, and on the need to deter limited attacks on U.S. and allied interests, as well as large-scale attacks, contain important lessons for security policy in the Asia-Pacific region. The Wohlstetters also have carried out security research focused primarily on the Far East, including ways to limit the spread of nuclear weapons, the economics of nuclear power, and the possibilities of limited Soviet attacks in Northeast Asia and Southwest Asia. Further, Albert was instrumental in setting up the Security Conference on Asia and the Pacific in 1979, a forum in which Asian and American specialists meet from time to time to discuss security matters of common interest.

The Asia-Pacific region in many ways is more receptive to the strategic thinking of the Wohlstetters than is Europe, perhaps in part because of the pragmatic realism of Asians. In Asia, for example, there has not been the tendency toward overdependence on nuclear weapons for deterrence that we find in Europe. And, as some Asian countries have moved to the forefront of the ongoing revolution in technology, they seem less resistant than European countries to improving their security through use of advanced technology weapons. Finally, Asians are more realistic than Europeans about the limits of arms control negotiations for improving security.

Some large uncertainties hang over the future of the remarkable Asia-Pacific region, but I am confident that the nations and peoples of this area can rise to the challenge. At the beginning of the 1950s, novelist James Michener wrote in the following terms about the American view of the Pacific:

There is only one sensible way to think of the Pacific Ocean today. It is the highway between Asia and America, and whether we wish it or not, from now on there will be immense traffic along that highway. If we know what we want, if we have patience and determination, if above all we have understanding, we may insure that the traffic will be peaceful, consisting of tractors and students and medical missionaries, and bolts of cloth. But if we are not intelligent, or if we cannot cultivate understanding in Asia, then the traffic will be armed planes, battleships, submarines, and death. In either alternative we may be absolutely certain that from now on the Pacific traffic will be a two-way affair. I can foresee the day . . . when the passage of goods and people and ideas across the Pacific will be of far greater importance to America than the similar exchange across the Atlantic.²

In the almost four decades since those words were written, the people of the Asia-Pacific region and their leaders have managed that difficult course extremely well. With the same combination of realism and self-reliance, we can face the coming century with equal optimism.

Notes

1. These include the armed forces of the Soviet Union, China, the United States, Vietnam, India, North Korea, and South Korea.
2. James A. Michener, *Return to Paradise* (New York: Random House, 1951; reprint, Greenwich, Conn.: Fawcett Crest, 1974), p. 416.

13

The Third World in U.S.-Soviet Competition: From Playing Field to Player

Charles Wolf, Jr.

You Owe Me a Title, Albert

In the late 1960s Albert and Roberta Wohlstetter were working on an article about income distribution in the United States, addressing the question of whether income inequalities between blacks and whites were getting larger or smaller. In characteristic fashion, they extended the problem beyond the obvious issues and drew critical comparisons between the faults they found in the way that some authors analyzed domestic income distribution and the way these same people criticized U.S. policies in the Third World. One day Albert was describing this piece to me in some detail. Uncharacteristically, he and Roberta had not come up with the kind of pithy title that is a hallmark of the Wohlstetter style. I suggested "'Third Worlds' Abroad and at Home," also saying, "You owe me a title, Albert!" They used the title, but Albert still owes me one. To be sure, he and Roberta have repaid the debt in other ways and currencies . . . but one of these days I expect a title as well!

* * *

The Standardization of Misleading Terminology

Some of the standard terminology in the analysis of defense and foreign policy issues is misleading and inaccurate, notwithstanding its convenience. It is a code that saves the need for clarifying verbiage at what is presumed to be an acceptable price of imprecision. The term "Third World" is one example; "strategic analysis"—in the sense of the analysis of nuclear issues—is another.

Charles de Gaulle originated the term *Third World* (*tiers monde*) to distinguish the first two worlds—the industrial democracies and the countries of the Communist bloc, respectively—from the less-developed rest of the world. The designation *Second World* for the communist countries has become decreasingly relevant with the arrival of *perestroika* in the Soviet Union in 1985, the striking events in China since the late 1970s as well as since the June 1989 violence in Tiananmen Square, and other extraordinary events in Eastern Europe in recent years. The designation of Third World was a misnomer from its inception.

Indeed, the conventional wisdom supposedly captured by the term Third World is more conventional than wise. Underlying its usage is a series of premises and myths that are remarkably distant from reality. Consider the following myths about the Third World compared to the corresponding realities.

Myth I: The Third World, consisting of some 130 less-developed nations, is a reasonably cohesive entity, unified by similar interests and ideologies that enable its members to act effectively and in concert.

Reality: The nations of the Third World are in fact divided in many more ways than they are united and by many more conflicting interests than those that impel them to act as one. To be sure, certain attitudes—nationalism, sensitivity to foreign condescension, the waning propensity toward centrally planned economies, to name a few—are shared by many developing nations. But more fundamental, objective circumstances tend to divide them. For example, the Third World includes oil importers (Brazil, India, Pakistan, and Korea) and oil exporters (Saudi Arabia, Libya, Iraq, Mexico, Venezuela); rapidly growing and newly industrialized economies (Korea, Taiwan, Singapore, Thailand), and slowly growing or stagnating ones (most of the remaining nations); centrally planned economies as well as increasingly market-oriented ones; major international debtors (Brazil, Mexico, Argentina) and major international creditors (Saudi Arabia, Kuwait, Taiwan, Korea); communist nations (Cuba, North Korea, Vietnam) and vigorously anticommunist nations (South Korea, Taiwan, Singapore, Thailand, Turkey); nations ruled by military regimes and nations that have moved and are moving increasingly in democratic directions and that profess the primacy of civil over military control.

In sum, the rhetoric of third-world unity is more spurious than real. The reality of the Third World is not unity and homogeneity, but cultural, political, and economic diversity.

Myth II: Achieving significant and sustained economic development in the Third World is an intractable problem, made even more difficult by the rigidity and discrimination of the present global economic order.

Reality: Achieving rapid and sustained development within the current global economic order is much less formidable than is usually supposed. The means and methods to achieve it are well known, have been widely demonstrated, and are generally acknowledged even if they are not widely adopted. By and large, these recipes have been amply demonstrated by the impressive development of the small number of newly industrialized economies that have maintained average annual rates of real economic growth of at least 7 or 8 percent annually over the last ten years.

These nations have made economic progress by achieving political stability and infrequent changes of government, by providing a growth-promoting economic climate characterized by relatively competitive markets, receptivity to incentives for domestic savings and investment, and avoidance of hyperinflation. Orientation toward the market, while characteristic of the relatively successful third-world nations, does not necessarily imply private ownership or an inactive role for government. It does imply that, where government interventions occur, they usually are selective and limited.

As to the rigidity and adverse effects of the present global economic order, again the reality diverges sharply from the myth. In fact, the "old" order has been remarkably flexible rather than rigid and receptive rather than resistant to development in the Third World. Countries that adopt the well-known recipes for economic progress usually achieve it; those who do not usually fail.

Myth III: The primary objective of third-world nations is to modernize their economies as rapidly as they can.

Reality: To the contrary, most third-world leaders have other goals and objectives besides economic development. These include achieving greater national recognition and prestige in the international community, acquiring modern military equipment and capabilities to protect and further territorial and other national interests, and often agitating for international redistribution of income, rather than domestic economic growth. If one looks at behavior rather than rhetoric, economic development is among the goals and priorities of most of the nations encompassed by the third-world designation, but not at the top of the list.

Nevertheless, provided the imprecision of the terminology is recognized and the enormous diversity of the dozens of countries usually included in the third-world category is kept in mind, the terminology has the advantage of widespread usage. It also conveys the comforting sense that listeners or readers know what one is saying or writing, although in fact they may not.

Indeed, Albert and Roberta Wohlstetter themselves made effective use of the third-world designation in a notable article they wrote in the late 1960s, "Third Worlds' Abroad and At Home," which reflects their keen awareness of both the utility and the imprecision of the third-world terminology.¹

The Third World as a Playing Field for U.S.-Soviet Competition

The competition between the United States and the Soviet Union in the Third World has undergone profound changes over the past two decades. Moreover, the 1990s and the first decade of the twenty-first century will probably witness even more fundamental changes. I first review briefly the past and recent history as a prelude to consideration of possible changes that lie ahead.

The Third World as Playing Field in the 1970s

During the 1970s Soviet projection forces expanded dramatically. This growth of Soviet naval forces, air and sealift, and the supporting capabilities for projecting military power in third-world areas has been described in detail by James Roche and Bruce Porter.²

The expansion of Soviet power projection capabilities was accompanied by and associated with the expansion of Soviet forward-based forces in the South China Sea (Cam Ranh Bay), in the Caribbean, and in Southwest Asia. This expansion was partly the result of increased Soviet military outlays, as well as of reallocations among the five Soviet military services. It also resulted from the *quid pro quos* provided in the form of basing facilities and rights for Soviet forces by such members of the Soviet family as Cuba and Vietnam in return for increased Soviet subventions extended in various forms to these fraternal states.³

The result of these changes was a dramatic shift in the ability of the Soviet Union to project power in the Third World relative to that of the United States and its Western allies. This general point, with particular focus on the change in the relative power projection balance in the Persian Gulf and Southwest Asia, has been meticulously analyzed and elaborated in numerous works by Albert Wohlstetter and colleagues over the past decade.⁴

Soviet subventions to these countries and other members of the extended Soviet empire were substantially underwritten by the booming oil market in the 1970s. The dramatic surge in world oil prices in 1973-1974, and again in 1979-1980, raised Soviet hard currency

earnings from oil and gas exports to over \$20 billion and contributed to a large expansion of Soviet activities and financing in the Third World through trade subsidies, export credits, military aid, economic aid, increased intelligence, and destabilization activities, culminating in the Soviet invasion of Afghanistan in December 1979. By the end of the 1970s the real economic costs of these expanded activities in the Soviet empire had risen to about 6 percent of the Soviet gross national product (GNP), compared to less than half of 1 percent of GNP devoted by the United States to its activities in the Third World.⁵

Contemporaneously with these changes in Soviet power projection capabilities, the United States experienced a debilitating defeat in Vietnam—a defeat heavily influenced by the erosion of political support for the effort within the United States, as well as by mistakes of strategy and tactics in the field. Probably the most fundamental American mistakes were the choices of whom to back in the political leadership of Vietnam—notably the multiple and wayward generals—and from whom to withdraw support—notably Ngo Dinh Diem.⁶

The Soviet Union's expanded activities in the Third World were conducted through an effective system for extending and defending both the contiguous empire in Eastern Europe and Afghanistan and the more remote Soviet empire abroad. This external empire expanded in the 1970s, extending from Cuba to Vietnam and encompassing a diversity of Marxist-Leninist fraternal states, notably Angola, Ethiopia, South Yemen, Nicaragua, and Afghanistan, as well as other cooperative and supportive countries. The Soviet imperial system, as it developed in the third-world playing field in the 1970s, was supported by a combination of sheer military power applied in Eastern Europe and Afghanistan, together with more subtle political, economic, security, and propaganda instruments applied elsewhere. These instruments were coordinated in what is sometimes referred to as the Red Orchestra under the management of the International Department of the Communist Party in the Soviet Union.⁷

The Third World as Playing Field in the 1980s

In the 1980s the U.S. role in the third-world competition with the Soviet Union expanded in concept and content. The U.S. role, which had largely been one of countering Soviet initiatives, became more active under the Reagan Doctrine. This doctrine was plainly foreshadowed in the president's State of the Union message of February 6, 1985, in which he said, "Support for freedom fighters is self defense, and is totally consistent with the OAS and the UN charters. . . . [We should] support the democratic forces whose struggle is tied to our

own security." In turn, this position was elaborated further by Secretary of State Shultz, "So long as communist dictatorships feel free to aid and abet insurgencies in the name of 'Socialist Internationalism,' why must the democracies, the target of this threat, be inhibited from defending their own interests and the cause of democracy itself?"⁸

The result was a substantial increase in U.S. support for the Mujahedeen in Afghanistan, UNITA in Angola, and the Contras in Nicaragua, as well as continued support for U.S. allies faced with communist threats in the Philippines, El Salvador, and South Korea. These efforts substantially changed the intensity and the outcome of the U.S.-Soviet competition in the Third World, although in varying degrees and with varying outcomes.

In Afghanistan, as a result of the strengthened military support for the Mujahedeen from the United States (in cooperation with Pakistan, the United Kingdom, and China), the Soviet position became increasingly costly and enervating, leading to withdrawal of Soviet combat forces in February 1989. In Granada an incipient communist state was forcibly suppressed by the United States and in Angola the struggle against the communist regime of da Costa shifted significantly in favor of Savimbi as a result of U.S. aid.

On the other hand, the Sandinistas became entrenched in Nicaragua as the result of a combination of expanded Soviet and Cuban aid and several other contributory causes: the failure of the Contras to realize effective coalitions among their field units, as well as with rural and urban elements in Nicaragua hostile to the Sandinistas, and the disputatious and vacillating political frictions between the White House and the Congress within the United States.

Contemporaneous with these changes on the U.S. side of the competition, economic stagnation in the 1980s imposed tightened resource constraints on the Soviet Union, resulting in diminished willingness under Gorbachev to sustain the costs of the Soviet empire that had been built up in the 1970s. While the maintenance and continued expansion of the Soviet empire remained a high priority, resources for these purposes became more acutely constrained in the 1980s. This situation seems likely to continue in the 1990s.

Nevertheless, the Soviets maintained, if not increased, their support for Cuba, Vietnam, and the Sandinistas and indeed increased their support for Najibullah in Afghanistan, notwithstanding withdrawal of Soviet forces early in 1989—an outcome that was diametrically opposite to the almost unanimous consensus of Soviet experts in the United States and Western Europe as recently as two or three years before the actual withdrawal took place.

The Soviet disposition toward new initiatives and aggressive competition in the Third World has diminished considerably as a result of several factors: fissures and the emergence of political pluralism in Eastern Europe; intensified and recurring ethnic dissent and disaffection in the non-Russian republics at home; and the constraints imposed by a low or negative rate of real economic growth, a decline in factor productivity, and a nearly flat and perhaps declining real per capita consumption. Instead, Soviet attention has been preoccupied with *perestroika*. As a result of the limited progress of this restructuring effort and its dubious prospects in the immediate future, the Soviet role in the third-world competition is likely to be acutely ambivalent in the years ahead—on the one hand placing greater emphasis on self-reliance among the members of the empire and on their diminished access to Soviet subventions, while on the other hand maintaining a willingness to devote resources to promising opportunities for expanding Soviet influence as they may arise. Resolution of this dilemma implies that more exacting criteria are likely to be applied by the Soviets in the future in determining and selecting what constitutes promising opportunities.

The Third World as Player Rather than Playing Field: A View of the Future Security Environment

The changes that are under way and that impend in the international environment are dramatic and pervasive. In the next two decades these changes will very probably alter in significant ways the competition between the United States and the Soviet Union globally and particularly in the Third World.⁹ The relatively rapid economic growth projected for the Northeast Asian and Pacific Rim countries is likely to make them increasingly important and influential international powers.¹⁰ Even if these countries do not significantly change their current policies and international alignments, their actions will carry more weight. And, of course, their policies and alignments may also change.

Economic development and technological advancement in newly industrialized countries will also tend to diffuse political and military power more widely. While the United States and the Soviet Union will remain in the forefront of advanced military technology, the most likely wars in the next two decades may well be decided on the basis of less advanced but still formidable technologies and weapon systems possessed by others. Numerous medium and smaller powers have ready access to weapon systems embodying 1970s and 1980s technology, including accurate surface-to-surface missiles and precision-guided munitions. Brazil, Israel, South and North Korea, China, and India are

able, and probably willing, to provide ample supplies of such weapons for other buyers. As the spread of weapons production capacity makes the arms field more of a buyer's market, the capacity of competing sellers and the advantaged buyers to do mischief in the Third World is likely to grow. In turn, the technological leaders—the United States and the Soviet Union—may feel obligated to offer their own new advanced equipment to third-world allies.

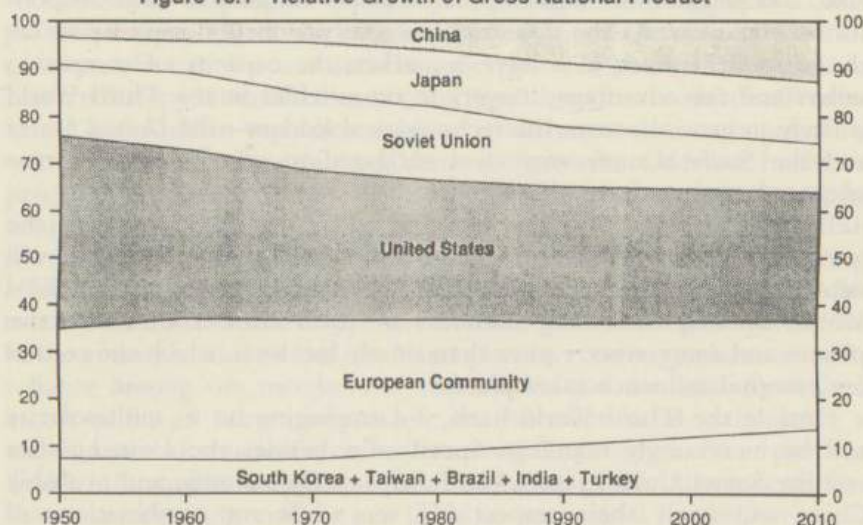
Dramatic changes are also likely to occur in other aspects of the international environment. In combination, all of these changes will determine the character of the U.S.-Soviet competition in the Third World, making increasing numbers of third-world countries active players and antagonists, rather than simply locales in which the contest for external influence takes place.

Outside the Third World itself, but impinging on it, multipolarity will be increasingly manifest. Specifically, besides the United States and the Soviet Union, Japan, the European Community, and probably China will apply their respectively very different combinations of economic, military, and political power to problems and issues that arise in various parts of the world. Even if Japan adheres to its more or less established constraint of spending no more than 1 percent or so of its GNP on military capabilities, its capacity to influence international events through the exercise of economic leverage will inevitably grow. For example, as the largest supplier in the international capital market, its ability to direct capital toward Latin America and the Middle East, or alternatively toward the Soviet Union and China, will inevitably be a powerful instrument for affecting developments in those areas. Indeed, this leverage may be a more potent instrument in many political and security issues in the Third World than the leverage that either the United States or the Soviet Union will be able to exercise.

Within the so-called Third World itself, various middle-level regional powers, including South and North Korea, India, Brazil, Turkey, China, and Taiwan, will acquire considerable economic, technological, and military capabilities with which to advance as well as protect their perceived national interests and to redress irredentist claims they have made in the past. The increasing dispersion of the various ingredients of power to actors that in the past have been constrained to relative passivity is likely to make the environment of the next few decades more dramatically different from the present than the present is from the environment of two or three decades past.

For example, the share of the global product represented by a subset of such middle regional powers will probably increase significantly, as indicated in Figure 13.1. While the military capital stocks (weapons and structures) of these middle regional powers will be substantially

Figure 13.1 Relative Growth of Gross National Product *



* GNP shown as percentage of the total for these countries (about 80% of global GNP in 1986).

Reprinted from Andrew W. Marshall and Charles Wolf, Jr., *The Future Security Environment*, Report of the Future Security Environment Working Group, submitted to the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988).

below those of the United States and the Soviet Union and probably also of various Western European countries, still the agglomeration of this capital in these countries and probably others will enable them, as well as their potential local partners, to bring power to bear against local adversaries. Table 13.1 shows estimates made in recent RAND work for the Commission on Integrated Long-Term Strategy that highlights this point.

The scenarios that might arise from this play of events can pose serious problems for both U.S. and Soviet policies. While each super-power will be influenced by the actions of the other, their policies increasingly will be dominated by considerations pertaining to the countries and regions of the local area in which the scenario or contingency arises.

For example, India might seek to interdict a Pakistani nuclear program or undertake military action against Pakistan for some other reason or in response to provocation. China might again decide to use force to resolve the recurring border problems with Vietnam, its long-standing disputes with India, or the unresolved issue of Taiwan.

**Table 13.1 Military Capital Stocks (Weapons and Structures)
of Selected Countries, 1950-2010**
(In billions of 1986 U.S. dollars) *

Nation	1950	1960	1970	1980	1990	2000	2010
United States	525	677	747	755	1157	1562	2089
Soviet Union	584	592	719	965	1278	1559	1867
Japan	0	6	15	31	55	82	115
China	107	103	129	211	236	392	785
West Germany	0	24	68	101	138	197	260
United Kingdom	78	113	130	139	171	227	284
France	52	74	91	107	148	215	292
India	8	9	15	21	42	81	131
South Korea	1	1	2	15	37	75	131
Taiwan	3	4	6	10	15	24	40
Brazil	7	6	8	9	10	12	18
Argentina	7	7	7	8	11	12	14
Turkey	5	8	12	23	33	48	68
Mexico	5	4	5	6	8	10	12
Egypt	18	14	17	37	39	44	51

* Converted from local currencies using 1980 purchasing-power parities.

Reprinted from Charles Wolf, Jr. et al., *Long-Term Economic and Military Trends, 1950-2010*, RAND Report R-2757-USDP (Santa Monica, Calif.: RAND, April 1989).

In addition, as noted above, several of these middle regional powers will increasingly develop their own production capabilities for all but the most advanced weapons systems and technologies. Such potential suppliers as India, China, South and North Korea, Brazil, and perhaps others will increase their already not-inconsiderable activity in the international weapons market as competitors to and perhaps displacers of weapons sales by the United States, the Soviet Union, France, and other established sellers. Once again, U.S. and Soviet policies that relate to the international weapons market will be influenced by a wide range of factors, only one of which is the posture of the other superpower.

In sum, the world of the next two decades is likely to be one in which independent centers of initiative, disturbance, and potential mischief will have multiplied throughout the so-called Third World. The ensuing instabilities will not be primarily or even secondarily motivated by the competition between the United States and the Soviet Union, nor will the stance of the USSR be the predominant consideration

in determining whether and how the United States should act in such contingencies when they arise.

Thus, the environment of the 1990s and the first decade of the twenty-first century, especially that of the bulk of the world referred to as "Third," will be fraught with instability as well as uncertainty. Borrowing Winston Churchill's characterization of a different situation, the Third World environment will be like a riddle wrapped in a mystery inside an enigma.

Numerous countries besides the great powers will have interests and instruments motivating and enabling them to undertake independent actions. And the instruments may well include advanced weapon systems, including ballistic missiles with biological and chemical warheads, if not nuclear ones. In some contingencies, the United States may choose to maintain a watchful distance. In others, it may attempt to establish a *cordon sanitaire* in collaboration with other partners. And in still others, the United States may choose some form of involvement, for example, to help beleaguered third-world friends, fragile democracies under attack, or emerging countries whose values and aims look more compatible with those of the United States than do the alternatives.¹¹ Moreover, the choice among these alternatives may well be only secondarily contingent on the position or involvement of the Soviet Union.

Instead, it is very likely that influences on U.S. policy will emanate principally from the players in the Third World themselves, rather than from sources outside the area that simply impinge on the Third World as a playing field. In this environment, U.S. defense forces will probably require a substantial reconfiguration that places greater emphasis on improved intelligence, enhanced flexibility, faster force deployments and operations, increased capability to act jointly with one or more third-world cooperating forces,¹² and the ability of small units to deploy rapidly and to deliver intense firepower with precision from standoff ranges.

The foregoing characterization of the emerging environment in the Third World suggests that much of the writing about the impending decline of the U.S. position in the world is misleading, if not irrelevant.¹³ The declinist vocabulary may have some applicability to the position of the Soviet Union, but is misguided when applied to the United States. With respect to some metrics, such as GNP, the U.S. position is more likely to be that of "incline" rather than decline relative to the Soviet Union, Western Europe, and much of the Third World, although the U.S. position may decline with respect to the Pacific Rim. In any event, the important point is not so much decline or incline, but rather that the emerging world environment is likely to be one of greater instability and a probably considerably lessened capacity of

the United States to control events. The source of this loss of control is not, however, the relative position of the United States compared, say, to that of Japan or the other large powers. Instead, it is more directly attributable to the emergence and increasing capabilities of middle-level powers and independent actors in the Third World itself.

Notes

1. Albert Wohlstetter and Roberta Wohlstetter, "'Third Worlds' Abroad and at Home," *The Public Interest*, vol. 14 (December 1969), pp. 88-107.

2. Bruce D. Porter and James G. Roche, "The Expanding Military Power of the Soviet Union," in *The Future of the Soviet Empire*, ed. Henry S. Rowen and Charles Wolf, Jr. (New York: St. Martin's Press, 1987), pp. 143-61.

3. Charles Wolf, Jr., "The Costs and Benefits of the Soviet Empire," in Rowen and Wolf, *Future of the Soviet Empire*, pp. 121-40.

4. Albert Wohlstetter et al., *Interests and Power in the Persian Gulf*, vol. 1 (Los Angeles: Pan Heuristics, February 1981) and Albert Wohlstetter, "Half Wars and Half Policies in the Persian Gulf," in *From Weakness to Strength: National Security in the 1980s*, ed. W. Scott Thompson (San Francisco: Institute of Contemporary Studies, 1980), pp. 123-72. X

5. Charles Wolf, Jr. et al., *The Costs of the Soviet Empire*, RAND Report R-3073/1-NA (Santa Monica, Calif.: RAND, September 1983) and Charles Wolf, Jr. et al., *The Costs and Benefits of the Soviet Empire, 1981-1983*, RAND Report R-3419-NA (Santa Monica, Calif.: RAND, August 1986).

6. See, for example, Marguerite Higgins, *Our Vietnam Nightmare* (New York: Harper and Row, 1965).

7. *The Red Orchestra: Instruments of Soviet Policy in Latin American and the Caribbean*, ed. Dennis L. Bark (Stanford, Calif.: Hoover Institution Press, 1986); Francis Fukuyama, "The Political Character of the Overseas Empire," in Rowen and Wolf, *Future of the Soviet Empire*, pp. 54-72; and Herbert J. Ellison, "Marxism-Leninism in the Third World," in Rowen and Wolf, *Future of the Soviet Empire*, pp. 73-91.

8. Reagan and Shultz are quoted in Charles Wolf, Jr., "Arming the Reagan Doctrine," *The National Interest*, no. 5 (Fall 1986). For more extended treatment of the idea of supporting democratic insurgencies, counterinsurgencies, and related issues, see Charles Wolf, Jr. and Katharine Watkins Webb, *Developing Cooperative Forces in the Third World*, (Lexington, Mass.: Lexington Books, 1987).

9. Andrew Marshall and Charles Wolf, Jr., *The Future Security Environment*, Report by the Future Security Environment Working Group, prepared for the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, October 1988) and *Discriminate Deterrence* (Washington: U.S. Department of Defense, January 1988), pp. 5-11.

10. Marshall and Wolf, *Future Security Environment*, and Charles Wolf, Jr. et al., *Long-Term Economic and Military Trends, 1950-2010*, RAND Note N-2757-USDP (Santa Monica, Calif.: RAND, April 1989).

11. It is interesting and more than a bit surprising that some influential members of the Congress—which itself is supposed to be adamantly opposed to U.S. involvement in remote areas, especially in Southeast Asia—have been in the vanguard of those urging U.S. military assistance for the anti-Khmer Rouge forces in Kampuchea, as well for the direct U.S. intervention undertaken in 1989 to remove Noriega in Panama.

12. See Wolf and Webb, *Developing Cooperative Forces*, esp. pp. 167–77.

13. See, for example, Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987); David P. Calleo, *The Imperious Economy* (Cambridge: Harvard University Press, 1982); Calleo, *Beyond American Hegemony: The Future of the Western Alliance* (New York: Basic Books, 1989); and Robert Gilpin, *War and Change in World Politics* (New York: Cambridge University Press, 1981).

14

Weapons Proliferation and the New Security Agenda

Jed C. Snyder

The Influence of Academics

Graduate students are inoculated early in their studies with the vaccine of humility, particularly important as one searches for a mentor to guide you through the labyrinthine network of the academic world and eventually career choices. In the search for a mentor, one grapples with the dilemma of balancing competing goals: striving to impress the professor with an encyclopedic knowledge and an insightful analytic approach, while always tempering this effort with at least a veneer of modesty and ignorance. This is particularly advisable in circumstances where the professor's demonstrated mastery of and appetite for intellectual combat is legendary.

The first rule in the search is to avoid lecturing a professor on an issue in which he is highly expert, especially one in which he may have played a central role in advising the government. I violated this rule early, but not often.

I was privileged to study under Professor Wohlstetter as a graduate student at the University of Chicago in the late 1970s and to serve as his research assistant for two years. As a latecomer to the field of international relations and national security (having concentrated on the sciences as an undergraduate), I was initially less familiar with the literature and the policy contributions of the senior figures in the field of strategic studies than were a number of my graduate-student colleagues.

I demonstrated this handicap when, at the first lecture of Albert's course on nuclear and classical wars, I opined confidently that "academics" had had relatively little effect on the course of U.S. strategic doctrine. Not fully realizing that I was facing one of the few academics who in fact had a significant influence on the direction of U.S. defense policy over more than three decades, I proceeded to insert my foot further into my throat by declaring that think tanks had little to offer government policy officials in the way of practical advice. As I was leaving

the lecture hall, a more senior student took me aside and suggested that perhaps I should look into the role played by the RAND Corporation and the Hudson Institute (two institutions that would later employ me) and also into the role played by academics like Albert Wohlstetter in the policy debate. I took this advice and was horrified to find Albert's hand in such key efforts as the examination of the vulnerability of strategic air bases in the late 1950s and the fierce debate over the ABM issue in the late 1960s.

I soon appeared at Albert's office looking quite wounded and embarrassed. Albert never mentioned my ill-informed remarks during his class, but instead offered me a position as his research assistant, where he probably thought he could determine for himself whether I was educable. I have always been extremely grateful for that opportunity, which opened up a new world for me and taught me that academics could in fact influence events.

* * *

For much of the postwar period the United States and its allies invested heavily in deterring a well-defined series of threats to Western security. The most prominent of these threats were generally regarded as emanating from a single source: the expansion of Soviet military power. Consequently, the principal objective of American security strategy during the last four decades was to contain Soviet military power and limit the strategic gains that might be accomplished through the use of that power.

While containment of Soviet power continues to be the central security concern of the Western allies, the prospects that over the next decade Kremlin leaders will seek to employ military force outside the USSR's borders for expansion of Soviet influence are minimal. The Soviet ability to project power globally will continue to be impressive, but the Kremlin's willingness to engage Western forces will be low.

Increasingly severe domestic pressures on the Soviet economy and polity are likely to command the attentions of President Mikhail Gorbachev and his colleagues in the leadership, turning their attentions and appetites inward. Preserving the integrity of the Soviet internal empire will preoccupy the Kremlin for the foreseeable future, leaving the state of the external empire uncertain and withered.

Events of the last year suggest a potentially radical transformation of the international security architecture. It is likely that 1989 will be regarded as a watershed, effectively demolishing the status quo assumptions governing East-West security policy as it has been practiced by the West. The organizing paradigm for most Western theorists and practitioners has been the rigid bipolar model of statecraft that has dominated the analysis and discourse of international relations since

the end of World War II. There is underway, however, a slow but certain evolution in the nature of security competition between the two superpowers away from an exclusively bipolar orientation toward an increasingly multipolar framework. U.S.-Soviet competition will be variegated over the next decade and less intense militarily.

This multipolarity will blur the previously sharp distinctions between East-West and North-South security issues. As third-world states acquire and eventually master increasingly sophisticated weapons technologies, regions previously classified as peripheral to Western security interests will become more central to the maintenance of those interests. As access to technology spreads beyond the superpowers, so does the potential that with the diffusion of these technologies will also come the diffusion of military power.

The diffusion of military power—the ready availability of advanced weaponry not only among industrialized nations, but throughout much of the Third World—is a key force for significant change in the security environment. It is a development with important implications for regional stability and will constrain the ability of the United States and the Soviet Union to project military force into regions where their strategic interests intersect.

Western contingency planning for military interventions in third-world theaters has generally proceeded from the assumption that local opposing military capabilities were not advanced relative to those of the larger European and North American powers and that therefore the combat environment into which Western forces would be projected would be relatively benign. Proliferation of advanced weapons to these regions over the last five years has fundamentally altered that planning assumption and already has affected, for example, how U.S. special forces are to be configured for such missions.

The proliferation of conventional, chemical, and nuclear weapons technologies to both pro-Western and hostile powers, from sources that are not always easily traced, has measurably complicated security planning for both regional and outside powers. Most alarming is the recent spread, particularly in the Middle East, of surface-to-surface missiles (SSMs) capable of carrying chemical and nuclear warheads over long distances with increasing accuracy.

This chapter assesses the impact of weapons proliferation on the security decisions of larger and smaller powers. Further, it evaluates the efficacy of arms control measures designed to control the spread of these weapons.

It is quite appropriate that the subject of weapons proliferation be included in a volume dedicated to the contributions of Albert and Roberta Wohlstetter. Long before the current alarm was sounded, the

Wohlstetters urged U.S. policy makers to recognize the danger that, in our preoccupation with superpower arms control, we would ignore the slow but certain spread of weapons of mass destruction to new nuclear aspirants whose interests were complex and whose behavior was inherently difficult to predict. The Wohlstetters warned against the dangers of discounting trends that clearly signalled a quiet but obviously menacing threat. Their pioneering analysis had a significant impact on my own thinking.

Proliferation as a Security Option

The most prominent Western policy goal in the postwar period, and therefore the central element of international relations for more than four decades, has been to stabilize the competition between the United States and the Soviet Union. For much of that period the favored instrument for achieving this objective has been the seemingly perpetual process of negotiating limitations on the growth of the U.S. and Soviet strategic nuclear arsenals. The goal was to achieve "stability" in the strategic nuclear balance in the hope of eliminating incentives for either nation to strike first. The core concern of American and Soviet leaders and much of their supporting policy elites was to achieve strategic stability through measures designed to limit what analysts have referred to as *vertical proliferation*.

This pursuit of superpower arms control has often been founded on the belief that the strategic nuclear balance was the most important instrument with which to measure the temperature of the U.S.-Soviet competition and that, if arms control was seen to be successful, the heat of the competition would decline. From this measurement, it was argued, conclusions could be drawn about the prospects for world peace. It was further argued by proponents of this approach that unless the superpowers set high standards for nuclear arms control, we could expect a proliferation explosion from smaller, generally less developed, states who would then follow the "reckless" superpower example.

One could argue, as do I, that both these assumptions are mistaken. First, during the height of the superpower arms control negotiations in the late 1960s and early 1970s, the United States and the Soviet Union also were most competitive against one another. For example, the most vigorous program of Soviet military modernization occurred during the Strategic Arms Limitations Talks (SALT). Further, Soviet expansionist policy in the Third World was launched by Leonid Brezhnev just as the SALT II negotiations were beginning in 1972.

The heightened adversarial character of the U.S.-Soviet relationship during this period is due largely to what Thomas Wolfe referred to at that time as the "great power dynamism" of the Soviet Union—the Kremlin's desire to play the role of a great power in world affairs.¹ Vertical proliferation became an actual Soviet policy objective, and the United States was obligated to act reflexively. Proliferation, in the Soviet view, was a necessary instrument toward their achievement of superpower status.

The Strategic Arms Reduction Talks (START), which will result in the first actual cuts in the level of superpower nuclear arms, and therefore should be regarded as more significantly affecting the anxieties of nonnuclear nations, have also not affected the behavior of aspiring nuclear nations, except actually to encourage clandestine programs. Indeed, we have witnessed the greatest surge of covert *horizontal proliferation* (the spread of nuclear weapons beyond the five declared nuclear states) during the period of the START negotiations, which began in 1981 and continue today.

The second assumption about proliferation, which claims a causal link between superpower arms control efforts and the behavior of other nuclear aspirants, is also questionable. There is no evidence to suggest that the security anxieties and other factors that affect proliferation incentives among the nonsuperpower nations become less compelling for those nations upon the signature of arms control accords by larger and often more distant powers. The signing of the SALT I agreement or the Antiballistic Missile (ABM) Treaty did not visibly retard the nuclear ambitions of potential proliferators. Further, it now appears that those military nuclear programs about which we are most concerned today were conceived during the late 1960s, when the superpowers negotiated, signed, and then pressed for ratification of the Treaty on the Nonproliferation of Nuclear Weapons. Indeed, a number of covert proliferators can be identified among the 140 signatories of the Nonproliferation Treaty, including at least one of the most dangerous bomb enthusiasts: Iraq. Baghdad signed the Nonproliferation Treaty just as it was embarking on its own atomic weapons program.² In this case, the Nonproliferation Treaty actually served to *shield* Iraq's genuine intentions from the treaty's architects: the United States, Great Britain, and the Soviet Union.

In sum, many of the assumptions governing postwar approaches to proliferation as a security problem were either incorrect from the start or have been overtaken by events. The security environment of the 1970s, which induced the current arms control regimes designed to retard both vertical and horizontal proliferation, has been transformed and these regimes no longer serve the purposes for which they were

created. This is due in large part to the increased pressures on states to invest in security insurance, which today is more likely to be found in the acquisition of advanced weapons, including nuclear and chemical systems, than it was a decade ago.

Redefining the Problem

In the postwar period, the term *proliferation* generally has been understood as a shorthand reference to the spread of nuclear weapons beyond the five declared nuclear weapons states: the Soviet Union, the United States, China, Great Britain, and France. Proliferation has been analyzed almost exclusively in this context. The preoccupation with things nuclear is derived from the larger Western concern to ensure strategic stability. In addition, the spread of advanced nonnuclear arms (e.g., chemical and biological weapons) was until quite recently not regarded as a serious threat. Further, controlling the buildup of conventional weapons, particularly in Europe, had proved after fifteen years of effort through the NATO-Warsaw Pact Mutual and Balanced Force Reduction negotiations to be unfruitful. Agreement on some conventional arms limitations through the Conventional Forces in Europe (CFE) talks has been achieved, but only after a radical shift in the East-West political relationship. This striking transformation has been brought about largely by societal revolution in the Soviet Union and the consequent political upheaval in Eastern Europe, which has for all practical purposes dissolved the Warsaw Pact as a military alliance.

Two key factors have contributed to the enduring and increasing attraction of nuclear weapons as a security insurance policy: (1) the erosion of the Western postwar alliance system and the perceived decline in the ability of the United States to offer credible protection to its allies and (2) the increasing opportunities for many nations to acquire nuclear weapons as the result of the spread of commercial nuclear power technologies.

In searching for a credible deterrent, states have either developed indigenous nuclear weapons programs or have sought the benefit of membership in alliance systems that provided a protective nuclear umbrella. In the cases of Britain and France, the alliance guarantee was regarded as insufficient and national nuclear deterrents were retained or developed even as NATO membership was maintained.

So long as the status quo was not challenged, those states whose security was protected by a framework of alliance guarantees had no incentive to seek additional insurance. For states outside of the network of alliances such as the North Atlantic Treaty Organization (NATO),

the Australian, New Zealand, United States alliance, and the U.S.-Japanese security treaty, the global balance of superpower forces provided a comforting, but often exaggerated, sense of universal stability. What Albert Wohlstetter referred to as the "delicate balance of terror" acted as a source of stability, so long as that balance was maintained.³

This balance could, however, be easily upset should the delicate network of understandings, particularly within alliance systems, be altered without compensating measures. For example, in the late 1950s a proposal was made by the Eisenhower administration to create a NATO deterrent of 300 Polaris missiles placed under the control of the North Atlantic Council. Eisenhower's objectives were to bolster the credibility of the U.S. nuclear guarantee to Europe's security and in the bargain to dampen increasing European enthusiasm for national nuclear forces independent of U.S. control. Eisenhower and his advisors judged that, in this case, nuclear weapons proliferation would contribute to, rather than detract from, American and European security.

Many analysts criticized the Polaris plan, citing: (1) its great expense and the fact that the European allies would not be able to benefit from large economies of scale; (2) the questionable military value of small nuclear forces, which because of their size were likely to be useful only against cities; (3) the vulnerability of the proposed forces, which included surface ships and therefore encouraged premature launch to avoid destruction through a surprise attack; and (4) the possible loss of control in a decentralized command structure where the allies might in a crisis launch their weapons independently of each other.⁴

The Eisenhower plan was perhaps the first U.S.-inspired effort to restore credibility to extended deterrence, which (at least to some) had begun to wane after only a decade. It is also a useful illustration of the paradoxical nature of nuclear proliferation. While public statements by U.S. officials have sensibly urged continued efforts to reduce the likelihood of a nuclear exchange between the Soviet Union and the United States, such efforts may in fact create anxiety in countries that have benefited from U.S. protection and who therefore privately regard the threat of a U.S.-Soviet nuclear exchange as stabilizing for their own purposes.

Ironically, the danger of a nuclear exchange has served to reinforce U.S. interest in bolstering the credibility of extended deterrence, and therefore the balance of terror has effectively strengthened the bonds of dependency between the United States and its allies. While the NATO allies have become increasingly uncomfortable as security dependents, they also realize the enormous benefits that accrue to a

nuclear protectorate. The decision of some of the European allies to develop independent national nuclear deterrents was probably inevitable, as was the declining credibility of the U.S. deterrent, given the pace of Soviet nuclear modernization. Yet, as the size of the U.S. and Soviet nuclear arsenals decline through successive START agreements and the levels of NATO and Warsaw Pact forces are significantly reduced through CFE and whatever security regime succeeds the current one, the European allies may find that their own nuclear forces could be more destabilizing than was the case at an earlier time when the Soviet threat was their paramount concern.

It appears that those countries most attracted to the nuclear option are to some degree unaligned; their strategic policies are pursued outside of the postwar systems of collective security alliances, by their own design or simply by political or geographical circumstance. Some of these nations adopted nuclear options only after they began to doubt that alliances would cater sufficiently to *national* security concerns (e.g., France). Others sought the military nuclear route because they perceived that a benefactor's power had withered as a regional guarantor (South Korea after the U.S. withdrawal from Southeast Asia). Still others pursued the atomic choice as a reaction to a U.S. policy change distinctly tilting toward an historic adversary, which was seen to exacerbate an already simmering military rivalry (Pakistan and India, and to a lesser extent Taiwan and the People's Republic of China).

Finally, there are the pariah states, whose isolation from the international community is due to overwhelming international rejection of their sociopolitical system (South Africa) or to a unique geographical isolation from allies (Israel).

The Commercial-Military Link

The vast majority of nations that embarked upon nuclear programs from which military applications evolved were initially attracted to nuclear power as a supposedly inexpensive source of energy for civilian purposes. The majority of these nations quickly learned that, without large economies of scale and a substantial capital reserve, it was unlikely that the civilian or commercial benefits of atomic energy would be realized in less than a decade or two.

This economic reality was not obvious at first, in large part because it was obscured by the panic created during the early 1970s when the Organization of Petroleum Exporting Countries (OPEC) significantly increased prices for non-OPEC nations buying petroleum from the Middle East. Until the OPEC price increase and the oil embargo levied against those Western powers whom the Arab states regarded as allied

with Israel during the October 1973 war, certainty of supply had been the hallmark of fossil fuels. As less-developed states began to search for energy alternatives, nuclear power appeared attractive to many of them. At the same time, however, the less-developed countries argued that opportunities to acquire the facilities and advanced technologies critical for establishing a nuclear infrastructure were now somewhat constrained by the Nonproliferation Treaty, which had entered into force in 1970. This is the genesis of the widely repeated complaint among the less-developed countries that the Western "haves" were denying the developing "have-nots" the opportunity to build for the future.

Increasingly, those nations that had chosen to pursue nuclear power as an alternative to dependency on fossil fuels were negotiating for the sale of reactors poorly configured to generate electric power on the scale normally required for the smaller nations. The OPEC-provoked panic to secure long-term energy supplies also created wildly exaggerated concern about the availability of uranium, needed to run heavy water reactors fueled by natural uranium or light water reactors fueled with enriched uranium.⁵

This concern drove many nations toward a premature and economically unsound decision to seek plutonium, obtained through the reprocessing of irradiated or spent reactor fuel. Most alarming from a proliferation standpoint, this plutonium was bomb-grade material, unlike the uranium burned in many conventional reactors.

Finally, the U.S. share of the world nuclear export market was shrinking, accelerated by the increasingly competitive production of light water reactors by Western European nations and their ability to enrich uranium fuel for those states seeking it. Previously, the United States had enjoyed a near monopoly in enrichment technology. Just as the perceived credibility of the United States to provide protection for its allies was withering, so was Washington's monopoly on the technologies that were becoming so attractive to the less-developed countries and that could also have formed the basis for potential economic alliances bridging the United States to the Third World.

Slowly, the United States realized that it must strive to secure greater control over two prominent proliferation threats: the supply of fissile (i.e., bomb-usable) material by Western nations to potential proliferators, the acquisition of which remained their greatest obstacle to building an explosive nuclear device, and the increasing third-world interest in obtaining plutonium through the reprocessing of spent reactor fuel.

Both threats were addressed by the Ford administration in 1976 (and to a certain extent were continued by President Carter), when it established the London Suppliers Group to evaluate the dangers of

unbridled nuclear commerce between weapons states or nations possessing exportable nuclear technologies with potential weapons applications on the one hand and nonweapon states on the other. In addition, it created the International Fuel Cycle Evaluation (INFCE) to encourage an international consensus on the need to identify the links between civilian nuclear power and military applications.⁶

At this same time the U.S. Congress began to consider whether foreign assistance appropriations provided leverage over the programs of suspected covert proliferators. In 1976 and 1977 it passed the Symington and Glenn amendments to the Foreign Assistance Act, which would deny economic and military assistance to nations seeking to obtain enrichment or reprocessing technology. In 1978 the Congress passed the Nonproliferation Act, which was designed to legislate restrictions on the U.S. transfer of nuclear technology and equipment to nations that had refused to place their nuclear reactors and fuel under a safeguards system of inspection administered by the International Atomic Energy Agency (IAEA).

The Ford and Carter nuclear policies focused almost exclusively on strengthening the obstacles to obtaining the technologies, equipment, and fissile material needed for a nuclear weapons program.⁷ While these initiatives were a necessary component of a nonproliferation strategy, the nearly exclusive emphasis on technological constraints reinforced the already potent argument, which resonated powerfully in the developing world, that the United States was denying depressed nations access to peaceful nuclear technology. Further, our allies in Europe and Asia, whose nuclear export industries would be seriously damaged if they acceded to American demands, were publicly condemning an imperial American approach that was criticized as perpetuating economic and industrial hegemony.⁸

Affecting the Proliferation Incentive

More importantly, however, from the standpoint of crafting a strategy to limit weapons proliferation, the U.S. government gave relatively little thought in the early 1970s either to affecting the incentives that propel states toward the nuclear option or to the imposition of effective sanctions against proliferators. That is unfortunate, since this period also coincided with the height of internal debates among political elites and military officers of suspected proliferators over whether to pursue the nuclear option.

There is a legitimate issue about the effectiveness of sanctions. Recall, for example, the late Pakistani president Mohammed Zia-ul-Haq's petulant response to the Carter administration's threatened action to

reduce security assistance to Islamabad if it did not halt its nuclear program. Zia balked, characterizing the U.S. aid program as "peanuts." Nevertheless, some analysts have argued that, in those cases where U.S. strategy did focus on a sanctions approach directed against states whose nuclear incentives were limited and where the decision to produce a device had not been irrevocably taken, the threat of sanctions "tipped the balance."⁹

A technological approach to stalling weapons proliferation will never by itself be an effective retardant, because it does not treat the incentives to proliferate. This is acutely demonstrated in the case of states that have overwhelming concerns—either genuine or imagined—about their conventional inferiority relative to a regional rival and therefore that give highest priority to reducing that asymmetry. Nuclear weapons are a politically attractive, if not always strategically effective, balancing agent in this quest for regional military influence. Their efficacy is a function of many variables, most importantly whether the rival is itself nuclear-armed and whether the threatened state is part of an alliance. Alliance membership is among the most effective counters to conventional military threats.¹⁰

Total reliance on the technology denial approach to stall potential or actual proliferators has another drawback: the long period of time that generally elapses between a nation's decision to pursue a nuclear weapons capability and the actual realization of that goal. Further, a state may waiver along the way, as its leaders calculate the opportunity costs of such a venture, which for less-developed countries can be enormous. Ironically, pursuit of a nuclear weapons capability and development of the expensive infrastructure this entails can constrain the proliferator's ability simultaneously to maintain a credible conventional deterrent. There are few cases where nations have been able to muster sufficient resources to do both; most, therefore face the dilemma of which road to take.

As Roberta Wohlstetter has shown in her insightful work on the Indian nuclear program, incentives to proliferate can be extremely powerful factors in pursuing very long-term security objectives. Further, a nation may decide not to immediately seek possession of a nuclear device, but rather to adopt an incremental approach that allows it to move toward that goal slowly and even to defer a decision actually to build a bomb. This strategy creates ambiguity (often deliberately) about the nation's ultimate intention and can also act to mask a covert weapons program. This approach ultimately reduces what Roberta Wohlstetter called the "critical time" needed to build an explosive device, which may be the key challenge to stopping proliferation by

"drifting governments" as compared to those that are determined from the start to have nuclear weapons.¹¹

Finally, if an aspiring proliferator pursues the legitimate objective of commercial power generation simultaneously with its quest for a military nuclear option, it becomes exceedingly difficult to apply technological constraints or outright sanctions effectively, or even to build a case that a violation of the Nonproliferation Treaty or the associated IAEA safeguards has occurred. Therefore, the tendency to differentiate sharply between civilian and military nuclear ventures and to craft export policies solely on the basis of that distinction is artificial and may actually encourage diversion of fissile material and other clandestine behavior.

Clandestine Proliferation and Nonproliferation Regime Effectiveness in the New Security Environment

Policy makers are quick to point out that the calamitous predictions of exponential growth in the number of nuclear powers made in the 1960s and 1970s have not materialized. They note with justifiable relief that the number of *acknowledged* nuclear weapons states has remained constant at five and that, aside from the Indian "peaceful" nuclear detonation in 1974, there have been few alarming events. In addition, a record of nonproliferation successes is also produced.

It is true that a number of Western nations have been dissuaded from acquiring nuclear weapons: West Germany, Italy, Sweden, Japan, and Switzerland, for example. It is unclear, however, that their nuclear abstention resulted from either the preventive measures taken by the United States, as claimed, for example, by Nonproliferation Treaty enthusiasts, or the transfer constraints embodied in the nonproliferation regime. It is more likely that their security imperatives have been met by other means and that the nuclear option was, therefore, not attractive. It should be noted, however, that none of the countries mentioned above has taken steps to make the nonweapons decision irreversible. Within the changing security climate of the 1990s it is quite plausible to foresee the nuclear choice becoming more, rather than less, attractive for some states, particularly Japan and Germany.

The "Nth" countries about whom we are most concerned today—India, Pakistan, Libya, Syria, Iraq, Israel, Iran, North Korea, Taiwan, South Korea, South Africa, and Argentina—are all more dangerous threshold proliferators than the larger industrialized powers that were of some concern two decades ago. Four of these states—Iraq, Iran, Libya, and North Korea—are signatories to the Nonproliferation Treaty, raising questions about the effectiveness of the nonproliferation regime

as a retardant to the spread of nuclear weapons. Indeed, in some cases the Nonproliferation Treaty may act as a shield for covert nuclear weapons programs.

Why are these threshold states more threatening as proliferators today than they were a decade or two ago? Because, in an increasingly multipolar world where the level of East-West competition is reduced and where security alignments shift and formal alliances wither or are disbanded, nuclear and chemical weapons are likely to appear increasingly attractive as security insurance to virtually all of the Nth nations.

Clandestine efforts to obtain such advanced weapons are likely to increase sharply in the next decade. This means that the nonproliferation regime will face pressures for which it was never designed. Further, the increasing frequency of reports documenting the discovery of international smuggling networks designed to obtain weapons technology, hardware (including timing devices and triggers for nuclear detonators), and fissile material covertly suggests that aspiring proliferators are making more determined efforts than has been the case in the past.¹²

The Nonproliferation Treaty was negotiated in an era when threshold states were expected ultimately to declare their nuclear intentions through a test of an explosive device. The fact that, with the exception of India, only acknowledged nuclear weapons states have carried out such tests was often cited as evidence that nuclear proliferation had been curbed. While a number of covert tests may have occurred (the evidence is not unimpeachable), the more plausible explanation is that overt testing has become too costly, politically and otherwise, particularly for those nations wishing to mask the genuine nature of their research programs. There is also reason to believe that threshold states have concluded that quality assurance can be obtained without testing.

It would be reckless for a threshold state to test until it had accumulated all the necessary materials for a weapon, including—most importantly—a sufficient amount of fissile material for more than one bomb. Open testing by an aspiring proliferator would risk a worldwide embargo on technology transfer, forcing its covert program to operate further underground and perhaps provoking a regional rival to put an end to its threatening nuclear ambitions, as the Israeli government did in 1981 when it struck the Iraqi nuclear facility at Tuwaitha.

A decade ago the greatest potential threat to the effectiveness of the nonproliferation regime was the negotiation of secret agreements between nations not party to the Nonproliferation Treaty and the IAEA safeguards system and therefore not subject to their jurisdiction. Increasingly, however, it appears that signatories who are suspected of behaving in ways that are antithetical to the treaty's goals may be the

greatest threat, not to the regime itself, which may be approaching obsolescence in any case, but to international security generally.

The Nonproliferation Treaty was designed to prevent the transfer of explosive nuclear technology or materials from weapons states to nonweapons states in order to deter the indigenous production or acquisition of atomic weapons. Ironically, however, the treaty does not prohibit signatories such as Libya and Iraq from accumulating fissile material as a component of a "peaceful" research effort subject to IAEA safeguards.¹³ Unfortunately, the inspected state generally determines for itself what is peaceful and what is military related. This encourages parties to the Nonproliferation Treaty to violate its spirit, if not its letter, while using their signatures on the treaty to deflect inquiries and to undercut investigations by the IAEA board of governors. This was illustrated in the case of the Iraqi nuclear program, which benefited directly from Baghdad's signature on the Nonproliferation Treaty and its pledge to adhere to IAEA safeguards.

Proliferation and the Diffusion of Military Power

As noted at the beginning of this chapter, the ready availability of advanced weaponry, including but not limited to nuclear explosives, not only among industrialized nations, but throughout much of the Third World, is a key force for change in the international security environment. Thus, the way in which we have defined proliferation must be revised to encompass an evolving threat whose implications for regional stability will directly affect the interests of larger powers, including the United States.

New Technologies, New Threats

At both ends of the technological spectrum the spread of modern weaponry is the result of competitive pressures in international arms markets. With the United States and the Soviet Union, the only current suppliers of assembled high-technology weapon systems, dominating the leading edge of the world market, European arms manufacturers facing limited and shrinking domestic markets must export advanced weapons to survive as competitive suppliers. At the same time, second-tier suppliers—Brazil, North Korea, Sweden, South Korea, and Israel—have met the market demand for cheap, reliable lower-technology arms.

At the upper end of weapons technology, the proliferation of advanced conventional systems such as surface-to-surface missiles, anti-armor weapons, smart submunitions, command, control, communications, and intelligence (C³I) networks, and aerial refueling systems all enhance

the offensive potential of lesser developed states, whose military capabilities have appeared comparatively primitive until recently. Spread of these weapon systems also will enhance the defensive capabilities of lesser countries, creating new obstacles to intervention by larger powers.

Another category of advanced weapons, best described perhaps as "unconventional," has reappeared with considerable strategic impact and has now been tested publicly with dramatic effect. The virtual absence of international condemnation after Iraq's successful use of chemical weapons during the 1987-1988 "war of the cities" with Iran may represent a strategic and operational threshold for future regional conflicts. Clearly, Iraq's decision to employ these weapons of mass destruction was affected by Iran's inability to respond in kind or to mount a robust defense against them, so that the ultimate precedent-setting nature of the chemical attacks is uncertain. Nevertheless, the use of chemical weapons, including mustard gas and nerve agents, and the reported development of biological weapons (toxins) will alter calculations of deterrence by both regional and outside powers.¹⁴

Iraqi use of these unconventional weapons was facilitated by their acquisition and in some cases indigenous manufacture of the delivery systems: increasingly accurate ballistic missiles capable of carrying conventional, chemical, biological, or nuclear warheads. The ballistic missile threat is perhaps the most destabilizing development for regional security that has appeared in the last decade. Reduced warning times and precision guidance will increase the attractiveness of preemption, to the extent that potential opponents believe themselves to be incapable of adequately defending their vital interests against missile attack.

In 1989 the Director of Central Intelligence testified that at least fifteen developing countries were building or acquiring ballistic missiles.¹⁵ Nonpublic estimates reportedly are even higher. The vast majority of these countries is located in the already volatile regions of the Middle East and Southwest Asia and includes Afghanistan, Algeria, Egypt, India, Iran, Iraq, Israel, Kuwait, Libya, Pakistan, Saudi Arabia, Syria, North Yemen, and South Yemen.

The missiles fall into three categories. The least-capable systems have ranges of 40-150 km, and include early generation weapons like the Honest John, which NATO retired in the early 1980s. The Soviet variant, the Frog, has been sold to roughly a dozen Soviet allies since the early 1960s. The Chinese have sold several variants of these shorter-range missiles, as well as technology later used by recipients to develop indigenous systems like the Iranian Oghab, Nazeat, and Shanin-2 missiles. Egypt is building an 80 km missile, the Saqr, with foreign assistance, and other Arab states are purchasing the Astros II SS-60

from Brazil. Pakistan has begun building its own 80 km missile, the Haft-2. Although these are less lethal than later-generation systems, they can be made more effective by altering the warhead so that more advanced munitions can be carried, including packages of cluster weapons and chemical agents. Such weapons would be effective against softer civilian targets.

A more lethal missile in this range class, the Soviet SS-21 or Scarab, is considerably more accurate than its predecessors, but is limited by its 100 km range. Nevertheless, its improved accuracy allows it to be used against harder targets, including air bases and surface-to-air missile emplacements.

The second class of SSMs is considerably more lethal, with ranges of 150–600 km. The most prominent weapon in this category is the Soviet Scud B, whose range (280 km) and inertial guidance system have made it an attractive weapon for countries interested in adapting it for particular missions. The North Koreans, for example, have reverse-engineered the Scud, begun domestic production, and reportedly embarked on an effort to double its range. Iraq adapted the Scud B to produce its own variant, the Husayn, with an extended range of up to 600 km. It became Iraq's most important weapon during the 1987–1988 war of the cities. According to one analyst, Iraq and Iran fired more than 400 Scud-type missiles at each other during the course of the war.¹⁶ In 1989, Iraq announced a further modification of this missile, deploying the 900 km al-Abbas.

The Soviets have found that the Scud B is the exportable missile of choice for a number of their clients and allies, having supplied it to Libya, Syria, Egypt, and Iraq.¹⁷ A successor to the Scud, the SS-23, would be ideal as a longer-range, highly accurate weapon, but its further production has been prohibited by the 1987 Intermediate Nuclear Forces (INF) Treaty. This came as a blow to Syria, which had hoped to acquire SS-23s from the Soviet Union.

The West has no counterpart for the Scud, although Israel still deploys the Jericho I, a 450 km system built by a French cosortium in the 1960s. India has tested a Scud equivalent, the Prithvi, which can strike targets at a distance of up to 240 km.

The longer-range systems (600 km and greater) are the most advanced and include the U.S. Pershing Ia, recently destroyed as part of the U.S.-Soviet INF agreement. One source reports that Israel requested Pershing Ia missiles from the United States in 1974, but that Washington refused.¹⁸

There has been some modernization of these longer-range systems. In the early 1980s, Israel began testing the Jericho II, with a reported maximum range of nearly 1,500 km. This missile has a demonstrated

capability: a recently-developed variant, the Shavit, was used in 1988 to launch an Israeli satellite. At its maximum range the Jericho II can reach Soviet facilities on the Black Sea, precipitating a recent Soviet protest to the Israeli government.

The most powerful weapon in this third category is the Chinese DF-3, East Wind, referred to in the West as the CSS-2, which has been sold to Saudi Arabia. Originally designed to carry a nuclear warhead, the Chinese retrofitted it with an early generation conventional warhead and have sold fifty to seventy-five to the Riyadh government. The Saudi decision to purchase the CSS-2 was curious, since its comparatively unsophisticated design makes it useful against military targets only when armed with a nuclear weapon.

The threat posed by ballistic missiles increased further as a number of nations have realized that they are excellent platforms for delivery of chemical weapons. A lucrative market for chemical weapons and their missile delivery systems has provided a strong incentive for a number of nations to circumvent technology transfer agreements and international conventions that prohibit such transfers. The Defense Intelligence Agency reportedly has concluded that twenty third-world nations are seeking chemical weapons for their military arsenals. The list of these countries is a subset of the ballistic missile proliferators mentioned above and includes Syria, Libya, Israel, North Korea, India, and Pakistan.¹⁹

In April 1987 the United States, Great Britain, France, West Germany, Italy, Canada, and Japan announced that they had established the Missile Technology Control Regime (MTCR), which was designed to prevent the export of technologies for ballistic missile systems capable of transporting payloads of 500 kg over a distance of more than 300 km. The regime's effectiveness was hindered from the start, as the Soviet Union and China, two of the most significant proliferators of ballistic missiles to the Third World, did not participate. Soviet interest in creating such a regime has, however, been noted by one former U.S. government official involved in nonproliferation policy.²⁰ Other proliferators of ballistic missile technology, some of whom are developing large boosters and launch vehicles, are also conspicuous for their absence from the group of MTCR signatories (e.g., Brazil and Argentina).

Finally, the regime's founders have themselves violated at least the spirit if not the letter of the MTCR restrictions. West German companies have manufactured and transported chemical agents to Libya, Syria, and Iran.²¹ A most alarming project is underway in Argentina, where the 800 km range Condor II missile is under development with German and Italian assistance, as well as financial backing from Iraq and Egypt.

Argentina clearly intends to export this missile, which has stirred great interest among the more radical Middle Eastern countries.

Conclusion

While the U.S.-Soviet strategic competition will continue, the rigid bipolar character of the East-West military rivalry is eroding significantly. Further, the battleground will be broader than the NATO-Warsaw Pact frontier, which will cease to be the primary arena as the U.S.-Soviet security competition is transformed. As Eastern Europe's independence from Soviet influence increases and a new pan-European security framework takes shape, European security will be a less urgent concern for the West and most particularly for the United States. Increasingly, non-Soviet threats to Western interests will emerge as policy concerns.

Western Responses to a Changing Strategic Environment

Weapons proliferation has always been a second-order security concern and it has generally been treated in a theoretical context rather than in concrete policy terms, in large part because only the nuclear dangers of proliferation have been highlighted. As this chapter shows, however, the nuclear dimension of proliferation is only one of a larger range of threats and, although frightening, perhaps is not the most urgent. Proliferation is a symptom of a metastatic condition: the diffusion of military power in distant regions where American and Western security concerns are seriously impacted.²²

If the Western powers are to respond effectively to the proliferation threat, their strategies for affecting events in distant regions will have to be revised. Principally, this means a less Eurocentric approach to the formulation of a security strategy. There are a number of elements to this revised approach.

First, sustaining its strategic influence will continue to require, for example, that the United States maintain some regional base structure and military presence, but oriented increasingly toward peripheral areas rather than predominantly toward support of U.S. forces in a Central European contingency. Over the last decade it has become clear that continued access to the most vital U.S. overseas facilities is problematic. In most countries where key U.S. installations are located this access has been placed at risk by a combination of factors, including the increased hostility of host nations to a visible and often politically objectionable American military presence, U.S. budgetary stringency

that has reduced available security assistance funds for host countries, and allied discord over the potential out-of-area power projection missions of U.S. forces using these bases.

The majority of America's overseas bases that are most vital for the future are located in the Mediterranean and the Pacific. These include facilities in Turkey, Greece, Spain, Portugal, Italy, and the Philippines. The Mediterranean facilities would be critical to rapid U.S. military intervention in the Middle Eastern/Southwest Asian theater, where the proliferation threat is most acute.

With the exception of Turkey and Italy, uninterrupted U.S. access is threatened in each of these countries. The U.S. military presence in Spain and Greece has already been curtailed as the price of maintaining access. It is unclear how long the process of chipping away at the U.S. base structure will be allowed to continue before the U.S. Congress determines that American withdrawal is the only reasonable option.

These pressures should force a reexamination of the conceptual foundation for U.S. overseas access. The need to accommodate the political and economic concerns of host nations will be a greater factor in determining whether shifts in the current basing network are required. Alternatives to long-term basing arrangements will by necessity become more attractive. New bilateral access agreements, for example, allowing periodic use of facilities (including during times of crisis) without the burdensome and debilitating costs often incurred in seeking a more visible, permanent presence, is one alternative. Negotiating new basing arrangements with nations that have not previously hosted U.S. forces is a second possibility, although the list of potential candidates is not long. Nevertheless, it is evident that many of the proliferation concerns voiced by the United States are echoed, albeit privately, by governments in the more moderate pro-Western states, particularly those in the Persian Gulf.²³

Technological alternatives to current basing concepts offer a supplementary option. Reducing dependence on fixed overseas facilities was recommended by the Commission on Integrated Long-Term Strategy as a means of diversifying U.S. basing.²⁴ The development of floating bases, as in the Arapaho concept, for deployment just over the horizon could reduce visibility and political costs for host governments while providing the United States and its allies with limited intervention capabilities, antisubmarine warfare platforms, mobile air bases, etc. There are costs in adopting these alternatives, however, and it is unlikely that technological solutions will totally replace substantial in-country combat capability.

Moving Beyond the Status Quo

The changing character of proliferation and the growing inability of the superpowers to control events outside their immediate security orbit demand a more urgent assessment of the impact of the changing security environment on American foreign and defense policy. The United States must, therefore, take steps to enhance its deterrent capability in areas beyond Europe.

Efforts to create security coalitions among states for the purpose of establishing formal alliances does not appear to be a viable option in the 1990s. Indeed, as argued above, the absence of the alliance alternative has played a large role in the decisions of regional antagonists to pursue proliferation as a security option.

Non-Soviet security threats, in particular well-armed third-world states, appear now to be potentially more menacing to immediate American interests than is the direct application of Soviet military power. These emerging regional powers will, for example, present significant obstacles to the deployment of U.S. power projection forces in a crisis. The Soviet factor has not, however, been removed from the security equation. In a multipolar environment the application of Soviet power will become more subtle and thus less vulnerable to orthodox responses. Over the last decade, the Soviet Union has developed resilient arms transfer and security assistance relationships with those third-world states who now represent prominent threats to regional stability, particularly in the Middle East. The consequent accretion of military power by these nations, the majority of whom are hostile to Western interests, is a useful reminder that, while a period of overt cold war between the superpowers is passing, its replacement is likely to be a more subtle variant than that to which we have become accustomed.

In sum, the proliferation threat is no longer susceptible—if indeed it ever was—to either the corrective or the preventive measures embodied in the controls established in the 1970s. As the West anticipates a period of relaxed East-West tension, it should also prepare for a new era of security challenges, where the absence of a “delicate balance of terror” could create an environment of instability, threatening the calm we have sought for so long.

Notes

1. Thomas W. Wolfe, “Soviet Interests in SALT,” in *SALT: Implications for Arms Control in the 1970s*, ed. William R. Kintner and Robert L. Pfaltzgraff, Jr. (Pittsburgh: University of Pittsburgh Press, 1973), p. 21.

2. For a discussion of the Iraqi nuclear program see Jed C. Snyder, "Iraq," in *Limiting Nuclear Proliferation*, ed. Jed C. Snyder and Samuel F. Wells, Jr. (Cambridge, Mass.: Ballinger, 1985), pp. 3-42.
3. Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs*, vol. 37, no. 2 (January 1959), pp. 211-34.
4. Albert Wohlstetter was a leading critic of the Polaris plan. See his argument in "Nuclear Sharing: NATO and the N+1 Country," *Foreign Affairs*, vol. 39, no. 3 (April 1961), pp. 355-87.
5. A detailed analysis of nuclear reactor technology is needed to appreciate the competing choices involved in planning and building a civilian nuclear power program and the comparative proliferation dangers of these decisions. For an excellent primer on these issues see *Nuclear Proliferation Fact Book*, Prepared for the Subcommittees on Arms Control, International Security, and Science and on International Economic Policy and Trade of the House Committee on Foreign Relations, 99th Cong., 1st sess., August 1985. Also see Ryukichi Imai and Henry S. Rowen, *Nuclear Energy and Nuclear Proliferation* (Boulder, Colo.: Westview Press, 1980).
6. Pioneering research on the issue of the connections between commercial nuclear power programs and their potential weapons applications was performed by the Pan Heuristics research firm, under the direction of Albert and Roberta Wohlstetter. The most influential product of this research was an analytical study completed under contract to the U.S. Arms Control and Disarmament Agency: Albert Wohlstetter, Thomas Brown, Gregory Jones, David McGarvey, Henry Rowen, Vincent Taylor, and Roberta Wohlstetter, *Moving Toward Life in a Nuclear Armed Crowd?* (Los Angeles: Pan Heuristics, April 22, 1976). This study formed the basis for a lengthy article by Albert Wohlstetter, "Spreading the Bomb Without Quite Breaking the Rules," *Foreign Policy*, no. 25 (Winter 1976-77), pp. 88-96, 145-79. See also Albert Wohlstetter et al., *Swords from Plowshares: The Military Potential of Civilian Nuclear Energy* (Chicago: University of Chicago Press, 1979).
7. For a discussion of the Carter and Ford nonproliferation approaches, see Joseph S. Nye, "Sustaining Nonproliferation in the 1980s," in *Nuclear Weapons Proliferation and Nuclear Risk*, ed. James Schear (London: International Institute for Strategic Studies, 1984), pp. 104-13.
8. For a sample of European critiques, see Karl Kaiser, "The Great Nuclear Debate: German-American Disagreements," *Foreign Policy*, no. 30 (Spring 1978), pp. 83-110.
9. Lewis Dunn argues, for example, that Taiwan and South Korea were dissuaded from reprocessing as a result of pressure applied by the United States. See his *Controlling the Bomb* (New Haven: Yale University Press, 1982), pp. 110-11.
10. Stephen M. Meyer, *The Dynamics of Nuclear Proliferation* (Chicago: University of Chicago Press, 1984), p. 62.
11. Roberta Wohlstetter, "U.S. Peaceful Aid and the Indian Bomb," in *Nuclear Policies: Fuel Without the Bomb*, ed. James Digby, A Policy Study of the California Seminar on Arms Control and Foreign Policy (Cambridge, Mass.: Ballinger, 1978), pp. 57-72.

12. See the annual study of proliferation developments by Leonard S. Spector, the most recent edition of which is *Nuclear Ambitions* (Boulder, Colo.: Westview Press, 1990).

13. For a more detailed critique of the nonproliferation regime see Jed C. Snyder "The Nonproliferation Regime: Managing the Impending Crisis," in *Strategic Consequences of Nuclear Proliferation in South Asia*, special issue of *The Journal of Strategic Studies*, vol. 8, no. 4 (December 1985), pp. 7-27.

14. For an excellent analysis of the Iraqi chemical and biological weapons programs, see Seth Carus, *The Genie Unleashed: Iraq's Chemical and Biological Weapons Production*, Policy Papers, no. 14 (Washington: Washington Institute for Near East Policy, 1989).

15. Hon. William Webster, Director of Central Intelligence, testimony before the Senate Committee on Governmental Affairs, May 18, 1989.

16. Seth Carus, "Missiles in the Middle East: A New Threat to Stability," *Policy Focus*, The Washington Institute for Near East Policy Research Memorandum no. 6 (June 1988), p. 4.

17. Magnus Clarke, "Ballistic Missiles in the Third World and the Proliferation of Strategic Defense Technology," *Arms Control*, vol. 10, no. 2 (September 1989), pp. 124-36.

18. See *Strategic Survey, 1988-1989* (London: International Institute for Strategic Studies, 1989), p. 17.

19. Reported in "Chemical Weapons Spread in Third World Poses Challenges to West," *Wall Street Journal*, September 15, 1988.

20. See Lewis Dunn, "Four Decades of Nuclear Nonproliferation: Some Lessons from Wins, Losses, and Draws," *The Washington Quarterly*, vol. 13, no. 3 (Summer 1990), p. 16.

21. For an excellent discussion of the labyrinthine network supporting the covert chemical weapons export industry, see Michael Ledeen, "The Curious Case of Chemical Warfare," *Commentary*, vol. 88, no. 1 (July 1989), pp. 37-41.

22. These issues are examined in a report of the Working Group on Power Projection, part of the 1988 Defense Department Summer Study on National Strategy held at the U.S. Naval War College and sponsored by the Director of Net Assessment, Office of the Secretary of Defense.

23. Author's discussions with government officials in Saudi Arabia, Kuwait, and Bahrain during a lecture tour through the region in November-December 1989.

24. See Paul Gorman, *Supporting U.S. Strategy for Third World Conflict*, Report by the Regional Conflict Working Group of the Commission on Integrated Long-Term Strategy (Washington: U.S. Department of Defense, June 1988).

15

Net Assessment as an Analytical Concept

Stephen Peter Rosen

The Search for the Dominant Solution

I first met Albert Wohlstetter in 1982 when I was working for Andrew W. Marshall in the Office of Net Assessment in the Pentagon. Albert was a member of the Defense Policy Board, whose work was being supported by the net assessment office, and I was rapporteur for the group. I had more extensive dealings with Albert and met Roberta when I moved to the professional staff of the National Security Council in 1984. There I worked for Donald Fortier on matters having to do with U.S. nuclear weapons policy and nuclear weapons proliferation, subjects in which Albert had been involved for many years.

I was struck most by two things about Albert and one thing about Roberta. What was most intellectually striking about Albert was what he has referred to as his obsession with "the search for the dominant solution." This essentially consisted of eschewing the search for variations of conventional solutions to policy problems in favor of a radical reformulation of an issue so that it became amenable to solutions that were not within the parameters of the conventional solutions, but that were clearly superior to them. His work on bomber basing in the 1950s had this character. When I was working with him, the search for the dominant solution meant for him the search for new ways of ensuring the viability of the U.S. command, control, and communications network in periods of intense crisis and war, and pathbreaking ways to take advantage of what he called the revolution in the accuracies of unmanned weapon systems. The striking thing about Albert personally was his total openness both to new ideas, provided they were expressed

I wish to thank Andrew Marshall, James Roche, and Eliot Cohen for allowing me to read draft manuscripts they have each written on the subject of net assessment.

coherently, and to the young people who advanced them. This characteristic is unusual in scholars of his stature and seniority.

The most striking impression left by Roberta was simply her warmth, charm, and kindness, an impression that she made on me when I first met her, one that was only strengthened on subsequent occasions.

* * *

Introduction

Nowhere in the relevant literature can one find a clear definition of net assessment as that term might be applied to military affairs. Andrew Marshall, who was the first and to this date the only director of net assessment in the Office of the Secretary of Defense and whose activities are discussed elsewhere in this festschrift, did not define the term in his few writings on this subject¹ or in his lectures on net assessment at Yale University in 1987. In those lectures he noted that the term had several connotations, including "comprehension at the highest level," a concern with the two-sided nature of military relationships, and the importance of comprehensiveness, even handedness, and attention to detail. He further noted that net assessment could be performed at many levels within a military organization and in peacetime as well as in war.² His students have derived varying definitions of the term net assessment, based on their experiences working for him. George Pickett, James Roche, and Barry Watts refer to net assessment as "the comparative analysis of military, technological, political, economic, and other factors governing the military capabilities of the United States (or some other military power) and its potential competitors. . . ."³ Eliot Cohen has defined the term more tersely but equally generally as "the appraisal of military balances."⁴

The lack of an agreed upon, let alone operationalizable, definition of net assessment appears to be both necessary and regrettable. It appears necessary because any mode of analysis, once reduced to a fixed set of terms and ideas, is almost inevitably reduced to a set of operational routines. Those routines, however useful they may have been to the people who originally developed them for a particular purpose, quickly become intellectual blinders that prevent their successors from perceiving reality. Therefore, good net assessment requires self-conscious rejection of a fixed definition of net assessment. It is regrettable because the lack of an operationalizable and teachable definition of net assessment means that it has tended to be driven out of the intellectual marketplace by modes of analysis that can more easily be defined and replicated. The analytic version of Gresham's

Law is that good modes of analysis that cannot be taught to ordinary bureaucrats tend to be driven out by bad analysis that can be so taught.

The situation is, however, not as bleak as it first appears. Net assessment as a mode of analysis may have a plausible definition that is not so rigid as to force reality into stereotypes, but that does distinguish it from the more general study of military balances. Net assessment, as I use the term in this essay, is the analysis of the interaction of national security establishments in peacetime and in war. The interaction of opposed establishments is the central concept, and the "net" in net assessment is the focus on the resultant of the interaction of these establishments.

This definition clearly distinguishes net assessment from more usual forms of military analysis that focus simply on our own military forces or those of the enemy. It is also different from simple or complex comparisons of friendly and enemy forces that compare the number and characteristics of enemy and friendly tanks, artillery pieces, or soldiers. Analyses that count and compare the same pieces of military equipment in opposing forces, and even those that count and compare a friendly system with the dissimilar one that will try to neutralize it in combat, are not net assessments. They are static, side-by-side comparisons that do not try to analyze the way these weapons would interact in combat. The definition of net assessment that I use also places less emphasis on some of the intellectual elements of the military balances that have been written of by the Office of Net Assessment, such as longer-term qualitative and quantitative trends in the military forces under analysis or asymmetries between friendly and enemy force structures and concepts of operations. Those intellectual elements are discussed by Pickett, et al., and are tools that are useful for pursuing the analysis of the interaction of military establishments, but are not necessarily central to that analysis.

Given that definition, it is possible, as Andrew Marshall has noted, to find examples of net assessment at various levels in the national security establishment and at various times in history. At the tactical level, officers in the American military are routinely taught how to do estimates of the situation or commander's estimates that help them to think through their own objectives, the situation within which they will try to accomplish their missions (including their capabilities, those of the enemy, and the environment), and possible enemy courses of action.⁵ The estimate of the situation is a tactical net assessment because it is a structured way of thinking through the likely interaction of forces that could occur when a commander uses his forces against an enemy who will fight back.

Net assessment can be carried out at levels above the tactical and in ways different from those appropriate for commander's estimates. The tactical interaction of military forces, while complex, is simpler to analyze in prospect than the interaction of entire nations at war with each other. The military theoretician Carl von Clausewitz probably deserves credit for being the first to try to delineate the general character of net assessment at the level of national military interaction. While he does not use the term net assessment, his emphasis on understanding war as a human activity directed against an animate, reacting enemy clearly indicates his awareness of the need to go beyond static evaluations of the strengths and weaknesses of each belligerent and his awareness of the need to consider the likely dynamic interactions of the belligerents. For example, in the sections of *On War* devoted to war planning, Clausewitz asks a simple question. In considering a prospective war, how can a government know how much force is necessary to bring to bear against the potential enemy? Clausewitz says, "We must gauge the character of . . . [the enemy] government and people and do the same in regard to our own. Finally, we must evaluate the political sympathies of other states and the effect the war may have on them."⁶ Deciding how much force is necessary to bring to bear depends on analyzing the interaction of an entire nation with the entirety of its enemy and with the rest of the international community.

Clausewitz is not particularly optimistic that the necessary information will be available for this comprehensive net assessment, but he is reasonably clear about how one would go about performing it.⁷ Similarly, his discussion of the concept of the enemy's center of gravity, the element which if successfully attacked can bring the enemy war-making capacity to a halt, displays a sensitivity to the need for analysis of the interaction of the two belligerents. Clausewitz does not make the common mistake of trying to identify enemy vulnerabilities in isolation or in the abstract. Enemy weaknesses are only meaningful in relation to the strengths of its adversary. An enemy "vulnerability" that its adversary is powerless to exploit is not a vulnerability at all. Only an analysis of the possible interactions of the belligerents can reveal strategically relevant vulnerabilities or centers of gravity, so Clausewitz insists that when one searches for the enemy center of gravity, "one must keep the dominant characteristics of *both* belligerents in mind."⁸

The practice, as opposed to the theory, of net assessment goes back at least to the Peloponnesian War as it has been represented to us by Thucydides. King Archidamus of Sparta confronted the growing power of Athens and was advised by Sparta's allies to declare war on Athens.

In response, he presented a net assessment of the balance between the two city-states. He began by comparing the strengths and weaknesses of Athens and Sparta: Athens was wealthy and had a navy; Sparta was poor and confined to land. But then, on the basis of the known characteristics of the belligerents, he speculates as to the likely interaction of the two states in wartime. If Sparta uses its army to destroy the crops of Athens, Athens will respond by importing food by sea. If Sparta tries to make the allies of Athens revolt, Sparta would then have to protect those defectors from Athenian reprisals. Since the allies of Athens were island states, protecting them would require a fleet, which Sparta did not have. As Archidamus worked through his analysis of the interaction of the two states, he came to a major conclusion about the likely character of that interaction: it will be lengthy, a war "that we shall be leaving . . . to our children to finish," as indeed proved to be the case.⁹

Pericles, the leader of the Athenian assembly, also performed a prewar net assessment of the probable conflict. He, too, began with a discussion of the strengths and weaknesses of the Spartan and Athenian societies: the Spartan command system was slow to come to a decision and was incapable of rapid reactions, while Athens was agile; Sparta was poor and so was less able to sustain a long war, while Athens was rich; Sparta lacked a navy and was incapable of building one, while Athens had the strongest navy in Greece. Then, also like Archidamus, he tried to think through what the interaction of the two states in war would be. Sparta would attack Athens on land. Athens would respond with amphibious attack. The war would be long, but would end in Athenian victory if Athens was careful not to engage in large-scale land offensives, which would play to the Spartan superiority in ground forces and the sensitivity of the Athenian democracy to casualties.¹⁰

These analyses were net assessments—albeit simple ones—because they did not merely observe that Sparta had more heavy infantry than Athens or that Athens had more ships than Sparta, but used the basic data about the military organizations and society of both states as the basis for thinking about how those forces could and should interact with each other in war.

Net Assessment and the Modern Military

How has this general concept of net assessment been applied in the context of modern military organizations? One way to begin a discussion of this question is to review several ways in which defense planners have tried to analyze the military problems facing their countries using

approaches that did *not* focus on the interaction of military establishments, to contrast these methods with net assessments.

Three times in the period between August 1939 and June 1940 the General Board of the U.S. Navy, a senior panel of active and retired Navy officers reporting to the secretary of the navy, sat down to write reports evaluating the military capabilities of their service in view of the world crisis that was developing in Europe and the Pacific. The question they posed for themselves was "Are we ready?" Their concern was clear. Would the U.S. Navy be able to conduct military operations to support the policies of the U.S. government?

Their reports represent one way of evaluating the adequacy of the military capabilities of the United States. The various components of the navy—its enlisted and officer personnel, its war plans, its ships, and its aircraft—were reviewed for their availability, suitability, efficiency, and sufficiency. The number of available aircraft, for example, was measured relative to the number that had been authorized by Congress. The number of battleships was considered to see whether it provided the United States with a ratio of five battleships to every three available to Japan, a ratio that had been established by the Washington and London naval conferences. Manpower was measured relative to the authorized strength of the navy and marines.¹¹ The suitability of the various pieces of equipment was measured by criteria left largely undefined, but which appear to have been related to procurement and modernization programs previously set in motion.

This analysis was not a net assessment. It was an attempt to see how well the U.S. Navy satisfied peacetime criteria that were not derived from an understanding of the possible interactions of the U.S. Navy with the German navy or Japanese navy, either in peacetime or in war. Building programs were measured relative to the budget lines that had been established for them. While there were simple comparisons of the number of U.S. Navy and Imperial Japanese Navy ships, there was no sense that there was a peacetime interaction in which U.S. building programs could affect Japanese building programs. There was no sense of the possible wartime interaction between the two fleets, let alone between the two nations.

Did other nations in this period do better? The French Deuxième Bureau in the 1930s had a section responsible for intelligence and counterintelligence with regard to the military capabilities of Germany. The director of that section set forth his objectives in 1936: "Our problem is to know at what time, against whom, and with what Hitler will attempt to accomplish the reversals which obsess him."¹² French intelligence was in fact concerned with whether and when Hitler would move against Austria, Czechoslovakia, and Poland and with the readiness

of the German army for various military operations.¹³ There was a focused concern on the intentions of the German enemy, but apparently with the mistaken idea that if the designs of Hitler were known, the analytical problem was solved. The French army did not need to ask how French and enemy forces would interact. It thought it knew. Artillery and firepower would dominate the battlefield as it had in the 1914–1918 war, and the task would be to utilize that firepower to avoid the expenditure of human life.¹⁴

British military intelligence in the same period was primarily concerned with the readiness of the German army for war and its size. The question of how it would fight was debated occasionally in 1937, and one report detailed the German concern with operations that emphasized surprise and speed, but this question was not given high priority and no clear answers were passed to senior British officials.¹⁵

Neither the British nor the French intelligence analyses were net assessments. They focused on discerning enemy intentions and capabilities without using those analyses together with analyses of their own forces to produce a net assessment of the likely interaction of the opposing forces and nations. Compared with the case of ancient Greece, these modern examples highlight an important problem of contemporary military organizations. Because of the specialization of functions, the officials responsible for knowing about the enemy have become lodged in different organizations than the officials responsible for the peacetime preparation of forces for war. Military officers with command responsibilities have become separate from intelligence officers. Neither, by themselves, is equipped for the task of net assessment, which requires intimate knowledge of both friendly and enemy forces as the basis for analysis of the interaction of those forces in peacetime or in war. Further, military and intelligence officials have become differentiated from officials who have intimate knowledge of the political condition of their own countries and who are capable of judging the likely response of the society as a whole to war or to peacetime competition. The only place in modern military organizations where the intelligence, force building, war planning, and political functions come together is at the level of the minister of war or secretary of defense. The question thus arises, How well did one of the most intellectually capable and energetic American secretaries of defense do in performing net assessments? The case of Robert McNamara and U.S. strategic nuclear forces provides a partial answer to this question.

In 1961, when Robert McNamara became secretary of defense, existing military analyses stated that the nuclear forces of the United States should be able to destroy 75–90 percent of the targets in the Soviet Union. This goal seemed arbitrary and the goal of destroying

20–25 percent of the Soviet population and 50 percent of Soviet industry was substituted, in large part because destroying more would require a disproportionately large number of American weapons. In the words of one analyst, the decision “was influenced by the fact of strongly diminishing marginal returns” in terms of Soviet citizens killed relative to the number of American weapons employed.¹⁶ The public record of that decision and the analysis behind it contain no reference to Soviet war objectives or military operations. As far as I can see, the American force requirement was thought to be independent of what the Soviet Union would try to do in a war or how it would try to do it, and reflected merely the need to have a force that could survive to inflict the desired amount of damage.

This kind of analysis did, however, try to think in a simple way about the interaction of the nuclear forces of the United States and the Soviet Union in war. Rudimentary models of nuclear exchanges sought to analyze the outcome of the mutual use of strategic nuclear forces. But the kind of net assessment performed for McNamara, commonly known as systems analysis, was curiously stunted. It looked only at the use of nuclear forces, without any consideration of how those forces might have interacted with nonnuclear forces. In that era, American medium bomber bases might have come under attack from Soviet weapons we did not define as “strategic” nuclear weapons or even from Soviet nonnuclear weapons. Soviet missile-carrying submarines would have come under attack by U.S. Navy ships and submarines that were not “strategic” weapons. Moreover, the behavior of U.S. allies, on whom we relied for bomber staging areas, was not considered. This systems analysis was a crude net assessment, but with the dominant elements of the possible interactions systematically excluded, largely because they were not amenable to quantitative measurement and modeling. In short, performing net assessment at the level of the secretary of defense by no means guaranteed useful results.

Net assessment is based on an intellectual approach that differs substantially from the modern examples discussed above. At the highest level it is for the use of the secretary of defense, and the questions that it tries to answer are those that arise when the overall capabilities and future shape of the American military are considered. It is not intended to provide a day-to-day management tool to review the efficiency with which existing missions are executed nor is it designed to alert the secretary of defense to the danger of an imminent war.

It is designed to pose and answer, however imperfectly, the strategic questions facing the United States. By strategic questions we mean those surrounding the Clausewitzian conception of strategy, which is the use of military campaigns to obtain the political goals of the nation,

but also those questions involving the peacetime problem of obtaining national goals by military competition short of war. More simply, it is concerned with the question of what the war will look like and what the character of our long-term military competitions may be. Given what we know of our own political goals and those of the enemy, given the observable behavior of the enemy as he prepares for war, and given our own plans, what will be the general character of the war? How can our peacetime military programs affect those of the enemy?

Analyzing the interaction of modern military establishments is made somewhat easier by dividing the problem into geographic or functional areas in which all the military activities are related to each other. In some sense, modern war will be global in its effects and interactions, and net assessment should ideally be done at the global level. In practice, however, military operations conducted in a geographic theater or functional area display a certain coherence that makes the character of their interaction more comprehensible at that level. American army, air force, and naval operations in the Pacific, for example, have engaged in the past, and would probably engage in the future, the enemy in quite different ways than in Europe. Thus, for the purpose of net assessment, the overall problem of thinking about the future character of the war is broken down into geographic areas, such as Europe and East Asia, or functional areas, such as strategic nuclear forces. It is recognized that none of these theaters or areas is completely isolated; events in each will affect and be affected by events outside them. Indeed, one of the results of thinking about the character of future wars is the recognition of connections between theaters that are not obvious. Despite the fuzziness of these theater or functional boundaries, analytically they are sufficiently distinct that they merit individual treatment.

Intelligence Collection and Analysis for Net Assessment

Asking such questions presumes they are answerable, at least in part. It will be recalled that Clausewitz was skeptical about the possibility of assembling the data necessary for net assessments in peacetime or, for that matter, during war. Net assessment conducted under modern conditions presumes that at least some of this information will be available. To what extent has this presumption proved correct in the U.S. defense establishment?

In practice, the natural tendencies of the American government have made it difficult to assemble such information. The intelligence agencies concerned with collecting information about enemy forces are

most often asked by policy makers to provide them with current, as opposed to historical, information. Personnel turn over regularly in those agencies, and the method of counting foreign military units and weapons changes as the intellectual disposition of the personnel changes. As a result, the Defense Department publication, *Soviet Military Power*, which is based on data provided by the Defense Intelligence Agency, includes some curious anomalies. Anyone trying to piece together trend information about Soviet forces would find, for example, in comparing the 1986 edition of that publication with the 1985 edition, that the size of the Soviet navy had apparently decreased by almost 20 percent in one year, from 2,580 ships to 2,092; that the number of armored personnel carriers in the Warsaw Pact had decreased by 22 percent, from 94,800 to somewhat more than 74,000; and that the combat radii of Soviet tactical warplanes had decreased by 12–25 percent in some cases and increased 50 percent in another.¹⁷ Such changes, if real, would represent shifts in the military balance of considerable importance. In fact, they were an artifact created by changes in counting rules that excluded Soviet ships of less than 1,000 tons displacement and that counted only Soviet armored personnel carriers west of the Ural mountains as part of the forces available to the Warsaw Pact. Such decisions do not represent any deceit or incompetence; all counting rules are by their nature partly arbitrary. If, however, a conscious effort is not made to go back and revise all past accounting to make it consistent with current rules, valid trend information cannot be produced. The seeming unimportance of revising intelligence reports that are generally discarded when they are superseded by new publications and, therefore, the time required to reconstruct consistent data make the conceptually trivial task of assembling trend data a practical headache.

The situation becomes worse when one tries to assemble information about American military forces. Although some information about trends in high-visibility weapons such as ICBMs and major naval ships is presented in the annual report of the Secretary of Defense, one can search in vain for historical information about the size of our tank or tactical aircraft inventories. Internal historical accounting is available from the Comptroller's office in the Office of the Secretary of Defense, but it is imprecise. It is important for defense management purposes to know how many organized military units exist, such as the number of aircraft squadrons or tank battalions, but the actual number of tanks and aircraft in those units varies as they are reorganized, and reconstructing the size of past inventories using consistent counting rules is difficult.

Other trend information is not available simply because certain force categories that make sense from a strategic point of view do not correspond to budget categories. It would be interesting to know whether the United States was spending more or less over time for its forces primarily for use in the East Asian-Pacific region as opposed to those for Europe. A reasonably important strategic issue is whether the Pacific Basin has become a more important strategic region for the United States than Europe. Because the budget of the Department of Defense is organized according to program categories, such as general purpose and strategic forces, such a question can only be answered imprecisely and with some difficulty. In trend analysis, as in war, the simplest tasks can become most difficult.

Information about trends in the behavior of Soviet military organizations is inherently difficult to collect. Unlike units of equipment, which can be observed with greater or lesser ease, patterns of behavior must be pieced together from written doctrinal statements by Soviet military officers concerning the way they would like to operate in wartime, from observations of peacetime training activities, and from efforts to reconstruct the ways in which the Soviet military evaluates its own performance. All these sources are subject to error. Doctrinal statements may reflect the position of certain bureaucratic elements within the Soviet military and not the way the actual commanders would wish or be able to operate in wartime.

Nor does the peacetime behavior of the Soviet military provide an unambiguous guide to wartime behavior. Peacetime training exercises are just that. In peacetime, military exercises are conducted partially to see whether all the units that are part of a military organization could do what they may be called upon to do in war. A capability that is tested in peacetime may or may not be one that will actually seem useful in the event of war. The fact that the strategic forces of the United States or the Soviet Union rehearse certain strategic options might indicate the desire of these countries to be able to execute these options in wartime. It might also simply be a reflection of the need to exercise particularly difficult problems of coordination so that peacetime commanders can test the ability of their units to communicate and act together in a short period of time. Peacetime activities could be experiments to try out concepts of operation that are never adopted.

Soviet public and secret publications about the way they measure the performance of their own troops can give us some insights into the capabilities Soviet commanders value most, but they may simply reflect the problem facing all peacetime commanders, which is to devise substitutes for wartime experience in order to have some way of evaluating troops in peacetime, even though the commanders know

full well that those surrogate measures cannot capture all or even most of what they will care about when the shooting starts.

Yet all these ways of obtaining insights into the patterns of Soviet military behavior tell us something about probable wartime behavior. What is stated as a doctrinal objective for Soviet troops will have some effect on what they seek to do. How they train in peacetime will have some effect on what they are able to do in wartime. And artificial measures of military performance may end up by creating military units that are able primarily to do only those tasks which can be measured in peacetime.

Military forces are large organizations that are products of their societies and political systems, as well as their own organizational histories and cultures. Because they are large and reflect long-standing values in their home countries, they will have certain persistent tendencies. While the means that are used to carry out certain missions can and will change more or less quickly in wartime, certain patterns of behavior will persist. Thus, while no one can be certain we could know what Soviet war plans look like in detail, it may be true that they all share certain operational goals, strengths, and weaknesses. The fact that the Soviet military, for example, has avoided for some forty years the purchase of large numbers of long-range strategic bombers tells us something about the role they envision for aviation in wartime. The fact that they have invested heavily in centralized communications systems and have repeatedly emphasized in writings and in actions the importance of tight central control of troops in wartime also tells us something about the general characteristics of war as practiced by the Soviet Union. If the Warsaw Pact allies of the Soviet Union have repeatedly rebelled against the Soviet Union in peacetime, it would be surprising if this did not affect all Soviet war plans. If the Soviet government has reacted vigorously, both diplomatically and militarily, every time an American ship, missile, or airplane capable of delivering nuclear weapons on the Soviet Union moves within striking distance of the Soviet Union, this tells us something about what kind of enemy forces will receive top engagement priority in Soviet war plans.

Studies conducted by civilian academics such as Nathan Leites of the RAND Corporation¹⁸ and Stephen M. Meyer of the Massachusetts Institute of Technology,¹⁹ by defense contractors such as John Battilega at Science Applications International Corporation and John Hines at RAND, and by members of the intelligence community utilize published Soviet doctrinal statements, Soviet military history, and intelligence information to assemble a picture of the kinds of military capabilities the Soviets have consistently tried to develop and the tendencies in

their own military they have consistently tried to avoid. From these studies, for example, has emerged a consensus that the Soviet high command has long been intent on achieving a high degree of central control over military operations, particularly over those that could involve nuclear weapons. Further, the Soviet command authorities appear to have an obsessive concern to prevent uncontrolled, spontaneous actions by lower-level military units. This kind of insight, supported by as much detailed intelligence and analysis as possible, is one input to the process of analyzing the likely character of the interaction of U.S. and Soviet forces in wartime.

In sum, the answer to the question of the availability of information to support the conduct of net assessments in practice is mixed. The information routinely generated by the American government does not provide a sound basis for net assessment, but such a basis has, in practice, not been impossible to construct.

Once the data for net assessments have been assembled, how does one utilize them? Net assessment emphasizes military interactions, so it also emphasizes the understanding of potential enemy military behavior, seeking to avoid the natural tendency to assume the enemy would behave as we would were we in his position or that our forces will engage like forces on the enemy side. For example, the North Atlantic Treaty Organization (NATO) will use tanks to defeat Warsaw Pact tanks. That does not mean that Warsaw Pact tanks will be used primarily to defeat NATO tanks. Instead, they are likely to be used to attack nuclear weapons storage sites and communications facilities. Similarly, while both we and the Soviets might use amphibious forces in the Third World, it is probable that these forces would never face each other in combat, so comparing the U.S. Marine Corps with Soviet Naval Infantry would tell us relatively little about how well either side would succeed in reaching the objectives it sets for itself in such wars. Soviet intercontinental ballistic missiles (ICBMs) launched from silos may or may not have as their primary targets U.S. ICBMs in their silos if a primary goal of the Soviet Union is to disrupt our command system without provoking an American nuclear strike on the Soviet Union.

In short, asymmetries in the military objectives and operations of the two sides are likely to be very important and it is difficult to understand how to measure our military power without understanding them. Quite simply, it cannot be assumed that the "natural" comparison of similar forces on either side, or even the comparison of forces with their "inverses" (e.g., tanks versus antitank weapons), are the relevant matchups. Some understanding of the character of the war must come first. This understanding must be based on knowledge of the goals

and general patterns of behavior of ourselves and the enemy. This knowledge appears to be what Sun Tzu had in mind when he emphasized the importance of knowing oneself as well as the enemy and of denying the enemy knowledge, if this was possible, of one's own "shape," that is, of one's own persistent characteristics.

If there are wrong ways to use data to analyze wartime interactions, what are the good ways of using these data? The U.S. defense analytical community has put much effort into the search for better analytical routines. For example, analysis of ground warfare often begins with a quantitative comparison of the forces at the disposal of both sides. Some means of factoring quality of the forces into that quantitative comparison are possible. This has usually led to a routine for evaluating and aggregating the firepower of opposing land forces. Most often this approach uses experienced military men to compare the effectiveness of, for example, a rifle carried by an infantryman with some weapon chosen as a reference standard. If a modern Soviet tank is arbitrarily given a value of 100, a rifle, in the judgment of the experts, will be thought to be 1/50th or 1/100th of the value of that tank and so receives a score of 2 or 1. Similar judgments are made for other, superior, tanks that may receive a score of 150, for artillery pieces, machine guns, helicopters, and so on. This method allows analysts to develop and run simple mathematical models of wartime interactions by using these aggregated force measures to determine force ratios, which can then be used to predict expected casualties and the movement of front lines.

But what happens if one applies this method to an actual historical battle, such as the battle of France in June 1940? Such a retrospective analysis has been carried out.²⁰ The results are intriguing. The overall military balance between the German forces opposite France and Belgium and the allied forces in that theater was almost equal, favoring the allies by a very slight margin. Allied armored firepower exceeded German armored firepower by about one-third. In the sector in which the Germans actually broke through, the Germans enjoyed over a four-to-one advantage, but in other sectors the allies had almost a two-to-one advantage. German airpower was double that available to the allies. Could one have come to any useful conclusions on the basis of these data? To the extent that the German success was the result of their ability to disrupt French communications in rear areas, to move faster than the allies could react, to neutralize enemy airpower and then take advantage, not of a favorable two-to-one ratio in the air, but of absolute air superiority, the answer seems to be "no." Net assessment would argue that an understanding was needed both of the French army after World War I, with its obsession for slow infantry

movements behind preplanned, centrally directed artillery barrages that were dependent on fixed headquarters with fixed telephone lines, and the interaction of that French force with the German army, which had come to emphasize rapid, deep penetrations to disrupt rear areas. This net assessment would not necessarily have told the analysts who would win the battle, but it would have shown what the important forms of interaction might be in wartime.

If quantitative modeling of wartime interactions does not offer much hope for producing useful net assessments, are there other routine, reliable ways of combining into a net assessment our insights into the probable character of enemy objectives with information about trends in observable military hardware and behavior? If such routines were available, net assessment would be less reliant on the judgment of analysts and less subject to the criticism that one man's picture of possible wartime interactions is just as good as any other. It would make possible the widespread dissemination of the methods and results of net assessments.

For these reasons, considerable effort has been put into developing easily used war games or political-military simulations of crises and wars. If a computer could be programmed with the operational characteristics and observable capabilities of the United States and the Soviet Union, simulations might be conducted that would reveal the character of future wars with somewhat greater reliability and reproducibility than is the case with other analytic methods.

War is a complex social and political activity. Developing a game or model that captures all of its relevant features is approximately as difficult as developing a model of human society. As a result, all war games and political-military simulations, whether they are conducted by computers or human players, have to date had to utilize grossly simplified models of behavior in order to make them playable in reasonable amounts of time. In the case of ground combat, each soldier's performance cannot be modeled. In many cases, individual army divisions cannot be modeled. Differences among actual army units would complicate the model, so hypothetical standard military units are assumed. In actual combat the bravery and competence of the commander and his troops, morale, surprise, deception, fatigue, disrupted communications, and the like introduce far more complexity than can easily be captured by a computer or by an individual manipulating game pieces on a game board.

Beyond the problem of complexity, war games to date have had to use data that were not developed to be used in the model, but—as noted above—were obtained through the routine peacetime budget, management, and intelligence activities of the American military. Data

not developed to simulate combat must be checked or validated in order to see whether it corresponds to known combat experience. In one survey of the data used in sixty-five games and simulations bought and used by the federal government, only 15 percent of the respondents stated that they had high confidence in the validity of the data they had used; that included one respondent who said that the location of the documentation to verify his data was unknown. In 37 percent of the cases there were either no efforts to validate the data or the efforts were weak.²¹ This problem with pseudo-data used in models is quite real.

In many cases there is no combat experience with which to validate peacetime data. The effectiveness of a weapon in peacetime tests or training can be measured, but its actual performance in wartime may be greater or less than peacetime data indicate. For example, the effectiveness of the eye of a pilot in detecting enemy anti-aircraft missiles fired against him was never incorporated into models of aircraft performance, yet proved to be important in actual combat over Vietnam.²²

Despite these difficulties, wargaming can be and has been useful in anticipating possible wartime interactions. When trying to gauge the possible impact of radically new military technology or operational concepts, the need for detailed, validated data with which to run a model is less important than the need for some kind of tool for gauging in very rough terms the impact of the new weapons on wartime interactions. Precisely because new forms of warfare have no military history to learn from, wargames and simulations are invaluable for anticipating new forms of military interaction. Wargaming at the Naval War College in the 1920s was used, for example, to gauge the possible impact on naval battles of carrier-based air fleets utilizing two hundred aircraft in a single strike.²³ Similarly, General Hamilton Howze has indicated that map exercises at Fort Leavenworth in the mid-1950s were useful tools for analyzing the possible impact of introducing helicopters onto the battlefield.²⁴

Problems arise when models and simulations are used without regard for their limitations. If models and simulations are useful for providing rough impressions of what the war may look like, they are far less reliable when used to answer such questions as "Who will win the war, with what forces, and in what period of time?" Unfortunately, these are often the questions that are posed to wargamers. This results in distorted or perverted net assessments.

In a symposium on war gaming conducted by the Department of Defense in 1979, one war gamer reported his personal experience with the ways in which such simulations are easily misused.

I made a major, major mistake early on. I wanted to make the thing [his computer war model] so it would seem a little sexier than it was. I used as a criterion the movement of the FEBA—the Forward Edge of the Battle Area [or front line]—comparing scenario to scenario on the movement of the FEBA. I put a caveat in my study and in the briefings: "Who knows what a day in a computer model is [compared to a day of real-world fighting]? These are just relative figures. All of these things are sensitive to assumptions."

But lo and behold, the figures got out: It took [the Soviets] so many days to get to the Rhine. . . . When people talk about running one war game or two iterations of a war game and they say, "That's the way the war is going to go," that is as ridiculous as one can be. . . . If there is one thing about a war game or a simulation about war, it's not going to be the way you have it in your simulation.

*That is your certainty.*²⁵

As a result of these problems and others, the Director of Net Assessment, Andrew Marshall, told the same meeting:

When I first got into this business in 1972, one of the first things I did was to call in some people and try to survey the models that existed to see whether there was really anything that was going to be of much use to me. The answer was, there wasn't. In none of the work I have done have we run a single model.²⁶

Conclusion

Thus, net assessment cannot be reduced to wargaming or modeling routines that are easily reproduced or taught to new analysts. For that reason, it may often be bureaucratically defeated by the weight of analysis that can easily be taught to civilians and military men. To the extent that net assessment can be done well, however, it does something more than make static estimates of who might win a war today or create unrealistic simulations. It can provide the secretary of defense with dynamic analyses of the way in which military conditions have changed in the past and the directions in which it may move in the future. It tries to lay out, with as much supporting evidence as possible, the probable character of a future war, where areas of strength the United States enjoyed in the past are eroding or growing, where the enemy is developing new capabilities, and where we have any kind of appropriate military response. It is, in short, a tool for a secretary of defense who wants to shape the future of the American military. It is less a critique of current conditions than a way of revealing those areas in which a secretary of defense could, over a period measured

in years, improve American capabilities where they have grown weak, take advantage of emerging aspects of the enemy military that may make them vulnerable, and begin preparation for new military issues that are visible on the horizon.

The Office of the Secretary of Defense and the armed services of the United States have many agencies that measure current military performance against current military goals. That is not the purpose of net assessments. Each net assessment concludes, not with a statement about whether we would win or lose a war today or with recommendations for new programs, but with a discussion of the issues and problems about which the secretary of defense may wish to think, because they affect the future of American national security. Net assessment is a tool for the secretary of defense that may better enable him to do strategic planning for the American military, if that is his desire.

Notes

1. See for example Andrew W. Marshall, *Problems of Estimating Military Power*, RAND Paper P-3417 (Santa Monica, Calif.: RAND, 1966); "A Program to Improve Analytic Methods Related to Strategic Forces," *Policy Sciences*, vol. 15, no. 1 (November 1982), pp. 47-50; and "Arms Competitions: The Status of Analysis," in *The Soviet Asset: The Military Competition Over Europe*, ed. Uwe Nerlich (Cambridge, Mass.: Ballinger, 1983).

2. Andrew W. Marshall, February 20, 1987, lecture at Yale University (lecture notes in author's possession).

3. Chapter 9, p. 177.

4. Eliot A. Cohen, "Net Assessment: An American Approach," paper delivered at the Jaffe Institute, Tel Aviv, Israel, January 2, 1990.

5. Summaries of this routine can be found in many places, including *Sound Military Thought* (Newport, R.I.: U.S. Naval War College, 1942).

6. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), bk. 8, chap. 3B, p. 586.

7. *Ibid.*, bk. 8, chap. 3B, p. 585.

8. *Ibid.*, bk. 8, chap. 4, p. 595, emphasis added.

9. Thucydides, *The Peloponnesian War*, trans. Rex Warner (New York: Penguin Books, 1986), p. 83.

10. *Ibid.*, pp. 121-22.

11. General Board File No. 425, Serial 1868, August 1939; Serial 1959, June 1, 1940; Serial 144, June 14, 1940. Microfilm Collection, Naval War College, Newport, R.I.

12. Paul Paillote, *Service Spéciaux 1935-1939* (Paris: R. Laffont, 1975), pp. 41, 44.

13. Robert J. Young, "French Military Intelligence and Nazi Germany 1938-1939," in *Knowing One's Enemies*, ed. Ernest R. May (Princeton: Princeton University Press, 1984).
14. See Ladislaw Mysyrowicz, *Autopsie d'une Défaite* (Lausanne: Editions, 1973).
15. Wesley Wark, *The Ultimate Enemy: British Intelligence and Nazi Germany, 1933-1939* (Ithaca, N.Y.: Cornell University Press, 1985), pp. 96-99.
16. Alain C. Enthoven and K. Wayne Smith, *How Much is Enough? Shaping the Defense Program, 1961-1969* (New York: Harper and Row, 1971), p. 207.
17. Amy Bodnar and Benjamin Schemmer, "Just How Big Is the Soviet Threat?" *Armed Forces Journal International*, vol. 123, no. 12 (June 1986) p. 32.
18. See, for example, Nathan Leites, *Soviet Style in War* (New York: Crane, Russak, 1982).
19. See, for example, Stephen M. Meyer, *Soviet Theatre Nuclear Forces, Part I: Development of Doctrine and Objectives*, Adelphi Paper No. 187 (London: International Institute of Strategic Studies, Winter 1983/4).
20. Phillip A. Karber, Grant Whitley, Mark Herman, and Douglas Komer, *Assessing the Correlation of Forces: France 1940*, BDM Report BDM/W-79-560-TR for the Office of Net Assessment (McLean, Va.: BDM Corporation, June 18, 1979).
21. Garry D. Brewer and Martin Shubik, *The War Game: A Critique of Military Problem Solving* (Cambridge: Harvard University Press, 1979), pp. 190, 193.
22. Clayton J. Thomas, citing *National Security Issues Symposium-1981*, MITRE Document M82-30 (1982). See Thomas, "Models and Wartime Combat Operations Research," in *Military Modeling*, ed. Wayne P. Hughes, Jr., 2d ed. (Alexandria, Va.: Military Operations Research Society, 1989), pp. 52-53.
23. Captain Harris Laning, Tactical Problem II (Tac 10 Mod 9), "Battle of Sable Island," History and Critique, October-November 1923, Class of 1924, Record Group 12, Naval War College Historical Collection, Newport, R.I., pp. 5, 28-30, 44.
24. Interview with General Hamilton Howze, History of Air Mobility Interview Series, Center for Military History, Washington, pp. 19-20. See also Frederick Bergerson, *The Army Gets an Air Force* (Baltimore: Johns Hopkins University Press, 1980), pp. 72-76.
25. Quoted in Thomas B. Allen, *War Games* (New York: McGraw Hill, 1987), pp. 293-94, emphasis in the original.
26. *Ibid.*, p. 303. Remarks by Andrew Marshall confirmed in telephone conversation with the author, June 1987.

16

Strategy as a Profession for Future Generations

Andrew W. Marshall

A Visit to Chartres and Jouy

One of Albert Wohlstetter's distinctive characteristics has always been his search for the absolute best of whatever is available. This has been true of everything: people, technical advice, furniture, medical care, and, perhaps most importantly, food. In the mid-1950s, travel to Europe increased for many people at RAND. In the fall of 1956 my wife and I were in Paris at the same time as the Wohlstetters—Albert, Roberta, and Joanie. Harvey DeWeerd was also there. Early one Sunday morning the six of us went off to see the cathedral at Chartres in a car Albert had rented. Albert had also noticed there was a one-star restaurant nearby, in the small town of Jouy. He telephoned to reserve a table.

It was unusually cold for November and, of course, the church was unheated. His enthusiasm and tutelage were unbounded while we muttered quietly and froze. Not a tympanum, portal, window, or carving went unnoted, inside or out. Finally we drove off to Jouy—ravenous and shivering. It was the first occasion for my wife and me to experience the wonderful French custom of a splendid Sunday midday meal. Our expectations were high—and were realized! A charming rustic inn, with gleaming copper pans hanging in an open kitchen. The ebullient patron and his wife all smiles and welcoming bon jours, a beaming presence in a room full of warmth and appetizing odors.

I cannot remember the entire meal, but its main features were two roast pheasants with appropriate garnishment and an excellent raspberry soufflé. Both the cathedral and the meal were memorable and excellent. We owe that to Albert and his effort to make the most of every occasion.

* * *

How does one become a strategic thinker? What sort of training

or apprenticeship is useful? What is a strategist? These are all difficult questions. For one thing there are problems of defining *strategic thinking*, or what strategy is. These definitional problems seem to be intractable, and to some extent it may be a matter of recognizing strategic thinking when one sees it. But, in general, strategy as contrasted to tactics deals with the coordination of activities at the higher levels of organizations. Strategy also focuses on longer-term goals and reflects a cast of mind that focuses on shaping the future rather than simply reacting to it.

Our vocabulary and use of words in these areas are seldom precise or accurate. The word *strategy* tends to be used in many ways. In particular I would note that in the national security area, which is the main focus of this piece, there is a constant tendency to think of military strategy as related principally to the application of resources in a possible future war and the general guidance for more detailed planning for specific contingencies. The result is that there is relatively little discussion of strategies for the peacetime management of our military organizations and for the allocation of resources over time so as to develop more efficient, effective, competitive military forces with appropriate doctrines and concepts of operations. Given the existence of nuclear weapons, the highest priority objective for the United States has been deterrence of large-scale war. In this we have been largely successful. Therefore, the strategic management problem in our national security establishment has been the peacetime competition to preserve and indeed enhance in the future our ability to deter the Soviet Union from actions adverse to our interests. Now even this definition of our priority objective may need serious amendment as we move into a more truly multipolar world.

It is clear that some people seem more readily able to address issues of strategy or the strategic management of our national security efforts. They have a willingness and a self-confidence to address larger, more basic issues than do others. They often appear to bring a very different perspective to the discussion of the issues of what our strategy ought to be. How do they get this way? What sort of training is useful? This is what I want to address in the next two sections.

What Environments Produce Strategists?

This is a question that deserves extensive study. All I can do is draw upon my experience in and observations of the environment at the RAND Corporation in the 1950s and early 1960s and my later experience in government in the period 1972 to the present. One disadvantage of focusing on RAND as a producer of strategists is that it clearly biases the discussion toward an analysis of the development

of people whose role has been advisers in the sense that Herb Goldhamer treated in his book, *The Adviser*.¹ There are other routes to being a strategist, including those who reach high positions in the military services or enter government service from other career lines such as the law or investment banking. But the case of RAND is perhaps of special interest because it did provide in the 1950s and early 1960s an environment that produced a number of people who are now acknowledged as major strategic thinkers.

The RAND Experience

There was something special about the RAND environment from the late 1940s through most of the 1960s. For one thing, especially in the late 1940s and the 1950s, there was a sense of being on the leading edge, of dealing with the centrally important problems. The invention of nuclear weapons and several other technology developments at the end of World War II produced a situation that was quite new, one in which the issue of what our strategy should be was extremely important. Another aspect of this situation, given the large increase in destructive power nuclear weapons introduced, was that there were no experts. Two small weapons had been used at the very end of World War II; what larger numbers of weapons might do to change the nature of war was unclear. Nobel prize winners were no better than graduate students in thinking about the relevant issues, and at meetings and working groups at RAND in the early days there was no hierarchy. This was an ideal situation for younger people (the average age of the professional staff at RAND in 1950 was about twenty-eight), who were immediately treated as equals and valued for what they could contribute to the discussions. This is a rare situation, certainly not characteristic of academia or normal organizations, and it led to the rapid development of individuals who were willing to address the broadest issues of national security. There was also a sense of having a preferred position with respect to access to information on the new developments taking place in weaponry, in particular in the design of nuclear weapons, their delivery systems, and other relevant technology.

Two other things favored the development of strategic thinking and innovation at RAND. One was the freedom RAND had to select the problems and the issues on which it worked. This is very different from the environment in contract studies organizations, especially now. The other was the presence of several remarkable men who set the intellectual tone and style of much of the broader analysis that began in the early 1950s. Two I would name are Charles Hitch and John Williams, the heads respectively of the Economics and the Mathematics

Divisions. Apart from their own intellectual contributions, their interest in the cultivation of full-ranging discussion, their intellectual fairness, and their interest in the development of younger people and of new methods of analysis all favored innovation.

One of the interesting things that happened at RAND was the success of the economists in assuming a leading role in the direction of a number of important studies and, more generally, in shaping the way in which RAND addressed national security issues. Initially the economists were brought into what had been largely a technological organization to deal with what was called the military worth function. It had become clear to the technical people that they needed some assistance in thinking about the objectives that military weapon systems were to achieve. There was also some interest in the economics of defense, especially as it dealt with issues of mobilization, and in the targeting of an opponent's industrial capacity and assessing damage to industrial societies from strategic bombing. The economists soon played a much larger and more central role in managing and directing a number of the successful studies. Why was this?

Herman Kahn and I used to discuss this puzzle. We had a number of hypotheses. For one thing the economics of the situation, broadly conceived, were important. What things cost, the level of resources that nations are able to devote to defense over an extended period—these all shape one's views as to the kinds of weapon systems that are desirable and feasible. But another advantage the economists had was that they knew from their own experience that experts could be wrong. Indeed, they also knew that much discussion of economic problems is foolish and that many widely held views, even among responsible people, are faulty. The experience of engineers and physicists is different. In those fields there are real experts who are much more likely to be right than are others. Economists, therefore, were more intellectually comfortable in the situation that existed with respect to nuclear warfare, in which there were no experts.

One of the people in the economics department who was the first to lead and manage a large RAND study was Albert Wohlstetter. Beginning in the early 1950s, he examined a set of issues connected with the basing of long-range bombers. The results of that study are discussed elsewhere in this book. I want to note what seems to me one of the major innovations or inventions Albert made in the conduct of that study. In previous large RAND studies, the practice had been to lay out a number of alternative systems or programs at the very beginning of the study. The study itself focused on evaluating which of the alternative systems was the most cost-effective.

Albert's approach was different. He started with a few alternatives to the existing plan or program, but as the study went on he evolved improved alternatives. He was also less rigid than had been the practice in setting down the criteria, the objective functions, the measures of effectiveness at the beginning of the study and simply sticking with them. His evolutionary approach developed additional criteria and tests of performance as more understanding of the problems and the issues emerged. This was, in my judgment, a crucial invention for doing these kinds of studies, because one would learn much more about the nature of the issues and the problems, how one ought to look at them, and what criteria were relevant as one went further along in the studies. Also, this way of conducting the analysis had the advantage of inventing additional and better alternatives to examine as one went along.

Another aspect of the situation at RAND that was exceptionally favorable to strategic thinking and innovation during the early period was the practice of inviting first-rate people to come and spend the summer. This created an environment in which the important thing was to try to tap into the very best talent in the whole country. The objective was not to do the best that RAND could do with its existing staff, but in a sense to do an analysis that was the best that the country as a whole could accomplish. By its very nature, any organization is limited in the amount and variety of talent, backgrounds, and insights that it can include among its staff. This attitude of searching for the very best people and drawing on the best talent is a key to excellence in broad thinking about any problem or issue. Unfortunately, most organizations do not operate this way.

There is perhaps a natural history to most organizations. When they are first formed they are focused on a mission, they recruit people who are enthusiastic and who devote themselves to the goals of the organization. As time goes on the organization becomes less flexible, accumulates some deadwood, and has some difficulty in sustaining the original vitality. Organizations sometimes are formed in especially suitable environments that allow them to flourish for a time. Then the external environment changes and the organization declines in vitality. In any case, the RAND of the 1950s and early 1960s was a remarkable place, both for the talent it recruited and for its atmosphere and intellectual dynamic. It was also remarkable for its boldness in addressing broader questions of strategy. It is, therefore, not surprising that some interesting and influential people developed there.

The U.S. Government

The next experience that is perhaps relevant comes from my time in government. Beginning in the middle 1970s, I was involved in

attempts to initiate strategic planning activities in the Department of Defense and in the direction of some strategic planning experiments. In particular, James Roche, then a navy commander, and I wrote several papers during 1975–1976 to promote strategic thinking in the Defense Department. We also sponsored contractor research on some aspects of strategic planning. This experience led me to believe that, while systems analysis had been a liberating force during its early development, by the middle 1970s it had become a constraint on thinking strategically. People who were systems analysts found it difficult to address the sorts of questions that we felt needed to be considered in strategic planning. People with a business background or a combination of business school and military service seemed to be among the best at taking up and addressing the questions we wanted dealt with.

We saw it as a vaccination problem: some backgrounds promoted strategic thinking and others seemed to inoculate people against it. Why is that? To some extent, the systems analysts had by that time developed routine approaches to analysis and perhaps had ceased paying sufficient attention to the complex consequences of acquiring the systems they dealt with. James Schlesinger made a comment to me a number of years ago that systems analysis proceeds by trivializing the measurement of effectiveness while perfecting the analysis and the estimate of costs. Programmatic actions, the acquisition of particular weapon systems, the adoption of a new concept of operations, or the setting of new objectives for military forces have complex consequences, including their effects upon the beliefs, actions, and resource allocation patterns of the potential opponents. Most of these consequences are not usually considered in the standard kinds of analysis. One result is that the top leadership of the Department of Defense often gets remarkably little assistance from their staffs when truly strategic decisions are addressed. This is because the focus of the work of the staffs, the criteria they use, and their measures of effectiveness are too narrow to account for the considerations that top-level decision makers in fact want to consider, are concerned with, and take into account as best they can.

Some decisions have larger and different consequences than others. For example, a decision to pursue or create a major strategic defense capability is different from a decision among several alternative programs for the next generation of fighter aircraft. The former involves going into a new business for the U.S. military (although it is a business we once were in), the latter the continuation of an existing business. Different issues are involved, different forms of analysis seem needed, but existing analysis methods tend to treat the two types of decisions

the same way. Part of the problem may be that much if not all of the existing analysis methodology was developed to assist in procurement or operational-planning decisions. Other methods of analysis are necessary when the questions are more like: What businesses should I be in? Where are my competitive advantages? One advantage people from the business world or business schools may have is that they are used to addressing these kinds of questions, though often with analysis methods that are less systematic.

What Backgrounds and Experiences Are Conducive to Strategic Thinking?

There is no specific set of disciplines that must be mastered to be a strategist. People who think strategically come from a number of different backgrounds. Among those whom I have met and feel that I know personally the best academic backgrounds seem to be economics, business school, applied technology (especially for those who have been in the business world), and in some cases political science. But what seems to be central is a cast of mind that is questioning, eclectic, able to devise the broadest kinds of issues and goals, and able to formulate appropriate ways of achieving these goals. A high tolerance for the uncertainty that necessarily accompanies any effort to think forward five, ten, or twenty years is required. For many people, some period of intense involvement in an important, large-scale project or enterprise has proved to be crucial.

World War II was such an experience for a number of people and, indeed, there may be a generational factor at work: living in interesting times may contribute to being a good strategist. People who were involved—even if only in staff positions or on the peripheries—in some major decision-making body connected with that war had a special quality about them. Experiences in World War II clearly had a significant impact on a number of the people who were at RAND during the 1950s. Because they contained many people with World War II experience the Truman and Eisenhower administrations had a character to them that favored strategic thinking. This characteristic of administrations has gradually eroded since the late 1950s.

The changes that we now see in the security environment of the United States will force another major effort of rethinking our situation, our goals, and our strategies. It might, therefore, be a period in which a new generation of strategic thinkers will emerge as a result of the critical experiences they will go through in the next decade.

Turning to the question of what kind of academic study or professional training might be useful, I would start with economics and business

school training, especially business schools that have strong programs in business policy and strategy. My recommendation about economics is, however, a guarded one. Since the 1940s and 1950s, economics training has become too mathematical, too focused on the acquisition of particular analytic tools that are not, in fact, of much use in the national security area. Something like the first courses in graduate school may be enough. They are important, however, because people who do not have a sense of macroeconomics and the fundamental trade-offs that societies have to make find it difficult to think clearly about the long-term implications of devoting large, possibly excessive, percentages of gross national products (GNPs) to military uses. The current state of the Soviet Union is in some part the result of decades of a heavy military burden, with perhaps on the order of 25 to 30 percent of GNP devoted to the military and the external empire.

In the early 1980s, when the first initiatives were taken within the Defense Department to encourage application of a set of ideas that later were labeled as competitive strategies, I had a discussion with the chief of one of the military services. His reaction to the idea of designing some military programs so as to impose increased costs upon the Soviets was negative, or at least cautious. He had two arguments against focusing on increasing Soviet costs or expenditures. The first was that the Soviets would simply spend the extra money, there were no reasons for them not to do so; the second was that our own budgets fluctuate so much that it was unwise to stimulate a competition which we ourselves might not sustain. The second of these arguments has real merit to it. The first shows an unawareness of the long-term consequences for the Soviets of high levels of military expenditures or of possible trade-offs between individual programs the Soviets might be compelled to make, since resources always are limited.

Another virtue of economics training, or for that matter business-school training, is that a modest amount of mathematics is acquired, as is some sense of the importance of technology and an ability to interact more effectively with technologists and hard scientists. This was one of the advantages the economists had over the political scientists at RAND in the early 1950s: quantitative analysis was something the economists were used to and their interest in or ability to discuss and understand what the technologists were up to was somewhat better than that of the political scientists.

Demography is another area that deserves much more attention than it has had in the past in the development of strategy. The relationship of demography to political and military behavior is likely to be an area of increased importance and attention. Demography is often brought into discussions of strategy and broad national policy,

but in only the most obvious and limited ways. William McNeill recently wrote a small volume addressing some of the broader relationships of demography to political behavior.² As in other of his works, he provides a number of hypotheses and sketches out areas that deserve considerably more attention.

Additional fields of interest are cultural anthropology, ethology, and some areas of psychology. In some ways a new understanding of man is emerging, based on study of the evolution of man and human society and on new analyses of the biology of man, in particular the functioning of the brain. How men process information, make decisions, and behave are central issues on which much new knowledge exists and more will be available in the future.

But above all, if I had a suggestion to make, it would be that people study, in any case at least read, history of all kinds: military history, of course, but also economic and technological history. The history or analysis of past wars is a major antidote to the narrow focus of many existing methods of analysis of defense issues. Most discussion of strategy and defense programs is, if anything, too focused on technology and weaponry and not enough on the other factors that often dominate actual warfare. Also, if one considers the extended competition between states such as Rome and Carthage, the issue of why the Romans won in the end may shed interesting light on the key variables that need to be considered in our conceptions of strategy.

Another thing that is of great importance is to understand the differences in the ways in which other nations are likely to perceive situations and react to them. Specialized studies of the strategic cultures of the Soviet Union, China, India, Japan, and the European nations are of great use. Some of this can be gained by reading the history of these nations, especially the development of their military and other national security organizations. Other aspects relate to the particular cultural characteristics of these societies.

The Future of Strategy

We are at a major turning point in the history of the world. A new structure is emerging, a more multipolar world with more complex alliance arrangements. Technology is likely to change the nature of warfare, much as it did in the period of the 1920s and 1930s. Then the development of naval aircraft and aircraft carriers revolutionized war at sea; on land the development of the tank and rugged, portable radios led to the invention of the panzer division and new concepts of operations that changed the nature of theater warfare; and, of course, there was the development of tactical and strategic air forces.

New weapons required the development of new doctrines, new concepts of operations, and new kinds of military organizations to exploit fully the new technology. How we are to maintain the U.S. military and national security position over the course of the next twenty years is a central issue that will have to be addressed. What our strategy should be for the more complex competition that is emerging will require consideration of many aspects of the changing security environment and changing technology. We will need to know much more than we now do about the emerging regional powers, as well as about the likely major actors, their strategic orientation, their strengths, and their weaknesses.

It is to be hoped that new centers of strategic thought and innovation will arise and a new generation of strategists and military innovators will develop to deal with these problems.

Notes

1. Herbert Goldhamer, *The Advisers* (New York: Elsevier, 1978).
2. William H. McNeill, *Population and Politics Since 1750* (Charlottesville, Va.: University Press of Virginia, 1990).

17

The Role of Character and Intellect in Strategy

Fred Charles Iklé

Biographers of "great" men and women keep reminding us that many of the most creative artists, writers, and scientists have lacked intellectual integrity, or moral scruples, or both. In fact, a noxious phenomenon common to all civilizations and all eras is the recurring coincidence of bad character and great genius. For a few domains, however, this coincidence does not hold true. Good work on national security strategy—unlike most intellectual endeavors—demands good character.

The demands on intellectual integrity are so exacting because in the development of security strategy the contradictions outweigh the harmonies, the uncertainties overwhelm the established facts, the proofs remain utterly incomplete, and yet the stakes exceed all earthly objectives. The strategist has to incorporate into his work the rich and precise facts of physics, engineering, geography, and logistics; he has to allow for the swirling currents and blurred edges of psychology, political science, and history; and he needs to fit all this into the dynamic of international conflict among nations—a dynamic of opposing objectives and clashing forces that is driven as much by human stubbornness as by human error.

The real world—our world of nation states, terrorist groups, and clashing armed organizations—is a world of mortal enemies. The strategist cannot will this world away as if it were a bad dream. Coping with real enemies is his very mission. But to cope means to induce enemies to be thinking, responsive, subject to our influence. The strategist must construct alternatives to mindless combat; he must invent incentives that will divert and divide the enemies; he must create and maintain inducements to restrain the enemy's use of violence; and he must think beyond the initial campaign of a war.

All this has been true for centuries, from Thucydides to Clausewitz. And since the first man-made nuclear explosion on July 16, 1945, these precepts have grown into awesome imperatives.

A good strategist always needs to be mindful of the ubiquitousness of mistakes. Major mistakes occur in all intellectual work. In some fields—cosmology, for example—scientific errors will scarcely affect our civilization. In other fields of science, mistakes entail quick penalties; errors in medicine or pharmacology might cause many deaths. In a way, the history of the physical sciences is a fascinating tale of errors in reasoning, errors in experimentation, and errors in theory building, tracing a zigzag course of progress in man's mastery of the universe. Similarly, the history of war through the ages can be read as a history of mistakes in military strategy, often patently avoidable mistakes and often egregious mistakes committed by both sides.

In the present era the danger of utterly catastrophic mistakes in military strategy is exacerbated not only by the destructive potential of nuclear arsenals but also by less obvious problems due to technological change. Decade after decade, new advances in technology can be exploited for military systems, to obtain a manifold increase in their effectiveness or strategic usefulness. Only part of this potential will, however, actually be realized for the equipment and armaments that major powers deploy. Moreover, most of the technological innovations that are eventually incorporated into military forces cannot be tested in realistic combat situations. The strategist, therefore, is confronted by large uncertainties. To what extent will technological advances be incorporated into the military forces of both friend and foe? And in the event of war, how would these essentially untested technologies shape the outcome?

A good strategist has to marshal all the methods of scientific inquiry to cut a path through this multitude of uncertainties. He must be capable of enlisting the enthusiasm of experts in many fields of science and technology, stimulating them to find new technical ways for accomplishing new strategic missions. He has to bring the best reasoning of economics to bear, since military forces actually deployed are always circumscribed by necessary trade-offs in resources. He should have the mind of a logician to bring order into this amalgam of different disciplines.

Quite a few smart people today who labor in the field of military strategy do master these disciplines admirably. Nonetheless, they lack the stamina to deal with the real world. They are like those "strategists" whom Winston Churchill had in mind when he wrote: "However absorbed a commander may be in the elaboration of his own thoughts,

it is necessary sometimes to take the enemy into consideration." To take the enemy into consideration takes strength of character.

Two types of character weakness are common among would-be strategists. Some find it emotionally too painful in the nuclear age "to take the enemy into consideration." This weakness has been particularly damaging for the North Atlantic Treaty Organization's (NATO's) doctrine regarding nuclear weapons. This doctrine, as we know, asserts that NATO would benefit from threatening to use nuclear weapons if it faced defeat in conventional warfare. But nearly all of the elaborate studies of NATO's so-called tactical nuclear weapons never penetrate to the question of what would happen if Soviet forces also used nuclear weapons. Since the question is too hard, the enemy is assumed to become mellow on the second day of the war—a war, remember, that he would have unleashed. Alas, what is mellow is not the enemy, it is the strategist who, like bad fruit, becomes mellow before he becomes ripe.

In the face of the horrors of nuclear warfare one can have sympathy with this preemptive mellowing. By contrast, the other kind of character weakness frequently reflected in strategic writings is rather repugnant. It is an infantile form of escapism, a way of turning the terror-fraught reality into funny little games with tin soldiers.

Like any comfortable pastime, this strategy game can be conveniently ended when the playing field gets messy, simply by kicking over the table with all the tin soldiers on it. It is said the tin soldiers are arrayed on the table to "deter" aggression, not to fight an invader. Occasionally the game includes the bombing of innocents, which is a neat little gambit called "city exchange," akin to trading queens on a chess board. To make the game good fun, it is kept simple by allowing only two players. No inconvenient questions about alliance cohesion are allowed. By definition, the enemy does not seek to cause some of our allies to opt out. No ambiguities here, the attack is "all out." And, of course, the game is symmetrical. Like chess, it is a matter of chance as to which side gets the first move, and there are always only two "sides," Side A and Side B, Twiddle Dum and Twiddle Dee. . . .

A strategist who possesses the necessary strength of character does not seek to escape from reality by turning his work into nuclear exchange games. He rejects unrealistic dilemmas; he insists on increasing the choices "between an unfree world and none." For him, the first task of strategy is to ask the right questions. He knows that national security strategy must seek to protect the fundamental interests of the nation, in every contingency and at every stage of conflict. He has no tolerance for the idea, so pervasive among the nuclear exchange merchants, that at some stage in a war national strategy can legitimately

become a temper tantrum, where those entrusted with protecting the national patrimony simply decide to "go all out."

It is not surprising, therefore, that the talent for creative work on security strategy goes together with a heart that clings to the beauty and values of our civilization. Given the magnitude of the stakes involved, strategy is not a vocation for stunted minds. "Let me have men about me that are fat," said Shakespeare's Julius Caesar. To do good work on national strategy almost demands a rotund intellect, a well-rounded personality. He whose vocation it is to work on these issues of war and peace cannot suffer from intellectual poverty. His soul must be in harmony with this world of ours. He must not only appreciate different cultures and good art, but also find nourishment in things that are beautiful and be endowed with a sense of humor. He might have, perhaps, an eye for architecture or painting, an ear for the best music; he must have a broad understanding of philosophy, literature, and, of course, history. And—why not?—let me have men about me that are sophisticated epicures.

It doesn't work the other way around, however: a taste for good food doesn't make a good strategist. A great deal of talking and writing about military strategy goes on and on. Much of it is like turning a prayer wheel: Oh Lord, let us have stability, to deter aggression, between the two sides, through mutual deterrence, with balanced forces, to have stability, to deter aggression, between the two sides. . . . But let us hasten to add that a fair amount of the writing on military strategy is pretty good. Pretty good, like the music composed by Christoph Willibald Gluck or by Antonio Salieri in eighteenth-century Vienna. And then—there was Mozart!

The genius of invention! The gift for discovery and inventiveness is a necessary endowment of a creative strategist. The "balance of terror" which Winston Churchill popularized and which had a "delicate" quality from time to time (that needed fixing, and that could be fixed) is not the last invention in nuclear strategy after which the prayer wheel takes over to give us "stability." Technology keeps advancing, contemporary history keeps evolving, the world's military geography is constantly being transformed. New facts call for new ideas.

Modern technology makes it possible to destroy military targets at a great distance without inflicting damage beyond the actual targets. Properly equipped and properly motivated, tomorrow's military forces (or even today's) can destroy threatening targets effectively, with discrimination, and in time to thwart any of a wide range of plausible aggressions—and thus deter these aggressions. The option of exercising such discrimination is the essence of managing the enemy's incentives so as to protect and preserve that which we wish to defend. And this,

of course, is the essence of strategy. Of course! As Salieri said about Mozart's melodies: "Of course, that's how it must be." And now we can all whistle his tunes.

Since his subject matter is never at rest, the strategist requires the constructive restlessness of a continuously inquisitive mind. The more seriously each study of strategy is taken, the more it turns into a continuing endeavor with always another mountain to climb. A composer of music can comfortably reach his last coda. While his symphony may be admired though it is unfinished, to be finished does not detract from a work of art. Not so for security strategy. When Carl von Clausewitz wrote and rewrote his book after the Napoleonic wars, he produced an extraordinary collection of essays, but it was a collection without an ending. Today, even more than in that relatively quiescent period, the closing chapter on strategy cannot be written. The true strategic thinker knows that to write the last coda would be contrary to his mission.

Appendix A

Albert Wohlstetter: A Biographical Sketch

Stephen Prowse

Albert Wohlstetter is president of the European American Institute for Security Research, a senior fellow at the Hoover Institution at Stanford University, and a fellow at the RAND Graduate School. He is advisor to the under secretary of defense for policy; vice-president of the Security Conference on Asia and the Pacific; a member of the Chief of Naval Operations Executive Panel; director of the Working Group on Strategy for the Western Alliance, which is part of the California Seminar on International Security and Foreign Policy; and serves on the President's Foreign Intelligence Advisory Board.

In all these positions Albert Wohlstetter has demonstrated a dedication to intellectual rigor and genius for solving complex real-world problems that has characterized all of his work since his training as a mathematical logician at the City College of New York and Columbia University in the 1930s. For more than thirty years he has done research on problems of arms and arms control, on protecting strategic forces and stabilizing deterrence, on U.S. policy in Europe, Asia, and the Persian Gulf, on advances in the technologies of discrimination and control, and on nuclear energy policy. His writings are prolific, and many stand as classics in their disciplines. He was a university professor at the University of Chicago. He has held professorships at the University of California at Los Angeles and at Berkeley and a fellowship at All Souls College, Oxford, as well as lecturing and conducting seminars at numerous universities and institutes throughout the world. He has been a member of the Board of Overseers for the Center for Naval Analyses and of the Academic Advisory Committee for the RAND Graduate Institute.

Albert James Wohlstetter was born on December 19, 1913, in New York City, where he attended DeWitt Clinton High School. He entered the City College of New York in 1930, where he studied mathematical

logic and the logic of science as an undergraduate and emerged with a Bachelor of Arts degree in 1935. After a year spent at the Columbia University School of Law he continued his study of mathematical logic as a graduate student at Columbia, where he became a university fellow and faculty scholar. He received his Master of Arts degree in 1941. During the war he worked as a consultant to the National Bureau of Economic Research and at the War Production Board in Washington, D.C. After a brief stint as program director at the National Housing Agency, he served on the board of directors of a construction company in Los Angeles. In 1951 he resigned this post to become a consultant at the RAND Corporation and became a senior researcher in the Economics Division in 1953. It was at RAND that his involvement with strategic issues began. In 1963 he left RAND and rejoined the academic ranks, becoming a university professor at the University of Chicago in 1965, where he taught and worked for fifteen years before becoming a professor emeritus in 1980. Wohlstetter has been director of research for Pan Heuristics since 1974 and has continued his contributions to strategic thought through his membership on numerous consultative groups and his scholarly writings.

Soon after he joined RAND in 1951 Albert Wohlstetter began working on a study of the vulnerability of the Strategic Air Command (SAC) to a Soviet preemptive attack (RAND Report R-266). The RAND basing study, as it came to be called, attracted the interests and collaboration of RAND colleagues Fred Hoffman, Henry Rowen, and Robert Lutz and displayed two characteristics that were to become trademarks of Albert Wohlstetter's work. The study was original, even unorthodox, in its approach to strategic issues—most analysts had never before adequately considered the impact that a surprise Soviet attack against SAC bases might have on the ability of the Strategic Air Command to launch a strike of its own. The study was also exhaustive in its analysis of operational detail, so much so that for those analysts that had considered the theoretical possibility of SAC vulnerability, the basing study lifted the problem to a new level of salience by showing that a Soviet preemptive attack was not only theoretically possible, but also operationally feasible. It was this latter quality that made the basing study's conclusions so hard for the air force to ignore, and its basic recommendations to reduce SAC vulnerability were subsequently adopted.

It is difficult to exaggerate the influence of the original basing study and its successors: *Protecting U.S. Power to Strike Back in the 1950s and 1960s* (RAND Report R-290), which considered SAC vulnerability to attack by both the intercontinental bomber and the then-emerging intercontinental ballistic missile (ICBM), and the essay Albert Wohl-

stetter wrote on principles and concepts arising out of the work on basing, which appeared in *Foreign Affairs* in 1959 under the title "The Delicate Balance of Terror." These analytical studies had a dominant influence on defense policy and operations generally and specifically on the report of the Gaither Committee, *Deterrence and Survival in the Nuclear Age*, which was presented to President Eisenhower in November 1957, with many of the recommendations taken directly from R-290. The "Delicate Balance of Terror" reshaped the character of the strategic nuclear debate among defense analysts and intellectuals by introducing the second-strike concept of deterrence. And, as scholarly pieces, R-266 and R-290 set the definitive standard of what systems analysis should be.

Albert Wohlstetter's work since has continued to maintain its originality, thoughtfulness, and attention to detail. He has succinctly stated the case for U.S. adoption of defense against ballistic missiles, both in the late 1960s and more recently in the debate over the Strategic Defense Initiative. He has addressed the problem of nuclear proliferation in a number of articles, and, with coauthors, in the influential book *Swords from Plowshares*, which analyzed with remarkable clarity and extraordinary range the relations between civil nuclear technology and the proliferation of nuclear weapons. This study suggested basic changes in U.S. rules regarding the development and export of nuclear reactor components. Many of its recommendations were reflected in the Nuclear Nonproliferation Act of 1978.

In a series of articles in the mid-1970s in *Foreign Policy* he artfully debunked the myth of a nuclear "arms race" between the Soviet Union and the United States, showing decisively that by no stretch of the imagination could the United States be considered to be in an arms race with the Soviets, whatever index one used to measure it. It is unfortunate that the lessons contained in these works have not been digested by the vast majority of those subsequently involved in the public debate on nuclear strategy and that the nuclear "arms race" is still blithely referred to as an almost iron law in the relations between the two countries.

In 1986 Wohlstetter was appointed cochairman of the presidential Commission on Integrated Long-term Strategy. The commission included among its distinguished members a former chairman of the Joint Chiefs of Staff, a former secretary of state, and three former national security advisors. Its report, *Discriminate Deterrence*, published in January 1988, generated considerable debate and interest, both domestically and abroad. A large number of its recommendations are being incorporated into U.S. defense and foreign policy.

A continuing theme has run throughout much of Albert Wohlstetter's work since the early 1960s: that the United States does not have to make irresponsible and immoral threats to end the world in order to deter the Soviet Union from aggression; and that by focusing on the technologies of discrimination and control not only can the United States maintain the long Western tradition that imposes constraints on conflict and emphasizes discrimination and proportionality, but can strengthen deterrence by attaining capabilities to make credible responses to various Soviet attacks on the West. He has been instrumental in arguing that the West does not have to subordinate all considerations of freedom in order to avoid the apocalypse.

Professor Wohlstetter's achievements in a wide range of fields have been frequently recognized by his peers. In February 1965 and again in November 1976 Professor Wohlstetter was awarded the Department of Defense Medal for Distinguished Public Service. He was the first person not employed by the Department of Defense to be awarded this honor and the first to receive it twice. In November 1985 he and his wife Roberta were awarded the Presidential Medal of Freedom.

By personal example and by training of other people he has contributed substantially to the development within this country of a group of analysts whose contributions to our national security has been of great importance. In total, Professor Wohlstetter's work has contributed immeasurably to the defense of the United States. The citation from the Presidential Medal of Freedom summarizes his and his wife's contribution thus: "Their powers of thought and exposition are in themselves among the Free World's best defenses."

Appendix B

Roberta Wohlstetter: A Biographical Sketch

Stephen Prowse

Roberta Wohlstetter is a member of the Council on Foreign Relations, the Council of the International Institute for Strategic Studies, the International Research Council of the Georgetown University's Center for Strategic and International Studies, the European American Institute for Security Research, and the advisory board of the National Intelligence Study Center.

She was educated at Vassar College, where after terms at Stanford, Heidelberg, and the Sorbonne she received a Bachelor of Arts degree in 1933. She subsequently received Master of Arts degrees in psychology and in comparative literature after attending Columbia University and Radcliffe College. Shortly afterwards, in 1939, she married Albert Wohlstetter.

She has taught at Howard University, Barnard College, and the University of Chicago (as professorial lecturer) and has lectured around the world, including at the Defense Staff College in Tel Aviv, the Council on Foreign Relations in New York, and the International Institute for Strategic Studies in London. She has been an adviser to the assistant secretary of defense for international security affairs and to the RAND Corporation. For the last thirty years a major concern of hers has been with contemporary political-military history and foreign policy, in particular with crises and with the uses and limits of intelligence in decision making.

After joining RAND in the late 1940s, Roberta spent much of her time investigating what it was about U.S. intelligence in 1941 that prevented anyone from foreseeing the Japanese attack on Pearl Harbor. The study was finished in 1957 and a declassified version was published in 1962 as a book, *Pearl Harbor: Warning and Decision*, which revealed how the failure to anticipate a surprise attack might reflect not simple blindness or lack of intelligence, but careful measures taken by the

aggressor and the confusion of the relevant intelligence traffic with the noise of other less relevant, perhaps even deceptively transmitted, signals. The book has won a number of awards, has been translated into French, German, and Japanese, and is regarded as a classic. The theory of intelligence advanced in this and her other publications is regarded as a leading hypothesis guiding other inquiries in the field and Mrs. Wohlstetter has applied it in studies examining the signals received before the Korean War, the Suez Crisis, Nazi Germany's invasion of the Soviet Union, the Cuban Missile crisis, and the invasion of Afghanistan.

Mrs. Wohlstetter has done significant work on nuclear proliferation, both in collaboration with her husband and independently. She has written on the development of nuclear weapon capabilities in India and on the nuclear debates in India, Israel, and Japan. She is a coauthor with her husband of *Swords From Plowshares* and of *Controlling the Risks in Cuba*, Adelphi Paper no. 17, published by the International Institute for Strategic Studies. More recently, she has done a number of studies on international terrorists and the potential nuclear threat they pose to the West. The high regard that exists for her work can be judged not only from the acclaim her public writings have received, but also by the number of classified and governmental reports to which she has been asked to contribute throughout her career.

Roberta Wohlstetter has received a number of distinguished awards. She was given the Bancroft Prize in Diplomatic History in 1962 and a Los Angeles Times Woman of the Year Award in 1963. In November 1985 she was awarded the Presidential Medal of Freedom with her husband, Albert. Throughout her career she has been a participant in the nuclear era's most momentous events, and her work has helped shape the ideas and deeds of statesmen in their efforts to create a safer world.

Bibliography: Albert Wohlstetter

- "The Delicate Balance of Terror." *Foreign Affairs* 37, no. 2 (January 1959): 211-34.
- "National Decisions Concerning Defense." In *Proceedings of the Second International Conference of Operational Research*, Aix-en-Provence. September 1960.
- "Nuclear Sharing: NATO and the N+1 Country." *Foreign Affairs* 39, no. 3 (April 1961): 355-87.
- "No Highway to High Purpose." *Life* 48 (June 20, 1960): 115 ff. Reprinted in *American Principles and Issues: The National Purpose*, edited by Oscar Handlin. New York: Holt, Rinehart and Winston, 1961.
- "Scientists, Seers and Strategy." *Foreign Affairs* 41, no. 3 (April 1963): 466-78.
- "Technology, Prediction and Disorder." *Vanderbilt University Law Review* (Winter 1963-64). Reprinted in *The Dispersion of Nuclear Weapons*, edited by Richard Rosecrance. New York: Columbia University Press, 1964.
- "Systems Analysis versus Systems Design." In *Analysis for Military Decisions*, edited by E. S. Quade. Chicago: Rand McNally, 1964.
- "Strategy and the Natural Scientists." In *Scientists and National Policy Making*, edited by Robert Gilpin. New York: Columbia University Press, 1964.
- "Sin and Games in America." In *Game Theory and Related Approaches to Social Behavior*, edited by Martin Shubik. New York: John Wiley and Sons, 1964.
- Controlling the Risks in Cuba* (with Roberta Wohlstetter). Adelphi Paper no. 17. London: International Institute for Strategic Studies, April 1965.
- "The Non-strategic and the Non-existent." In *Strategic Interactions*, edited by Kathleen Archibald. Berkeley, Calif.: Institute of International Studies, 1966.
- Strength, Interest and New Technologies*. Adelphi Paper no. 46. London: International Institute for Strategic Studies, March 1968.
- "Illusions of Distance." *Foreign Affairs* 46, no. 2 (April 1968): 242-55.
- "Perspective on Nuclear Energy." *The Bulletin of the Atomic Scientists* 24, no. 4 (April 1968): 2-5.
- "Theory and Opposed Systems Design." *Journal of Conflict Resolution* 12, no. 3 (September 1968): 302-32. Reprinted in *New Approaches to International Theory*, edited by Morton A. Kaplan. New York: St. Martin's Press, 1968.

Margo Hartman prepared this bibliography; Arthur Steiner assisted in getting it ready for publication.

- Making Up for Lost Time or Lost Utility*. Limited distribution RAND document. Santa Monica, Calif.: RAND, September 1968.
- "Defense Analysis: Two Examples." Statement and testimony in U.S. Congress. Senate. Committee on Armed Services. *Hearings, Authorization for Military Procurement, Research and Development, FY 1970, and Reserve Strength*, 91st Cong., 1st sess., pt. 2, April 23, 1969.
- "Good Guys, Bad Guys and the ABM." *Los Angeles Times*, August 3-4, 1969 (published in two parts).
- "Third Worlds' Abroad and at Home" (with Roberta Wohlstetter). *The Public Interest* 14 (December 1969), 88-107.
- "Bases and the Reversion of Political Control in Okinawa." In *Proceedings of Japan-U.S. Kyoto Conference*. 1969. In Japanese.
- "The Case for Strategic Force Defense." In *Why ABM?* edited by Johan Holst and William Schneider, Jr. New York: Pergamon Press, 1969.
- "Compromise or Assured Waste in Kwajalein." In *SAFEGUARD*. Washington: Committee to Maintain a Prudent Defense Policy, 1969.
- Statement and testimony in U.S. Congress. Senate. *Hearings before the Armed Services Committee, FY 1971*. 92d Cong., 1st sess., May 19, 1970.
- Race Differences in Income*. Monograph. Washington: U.S. Office of Economic Opportunity. October 1970. Reprinted in *Racial Discrimination in Economic Life*, edited by Anthony Pascal. Lexington, Mass.: Lexington Books, 1972.
- "On Vietnam and Bureaucracy." In *Great Issues of International Politics*, edited by Morton A. Kaplan. Chicago: Aldine Publishing Co., 1970.
- "The Future of Japan as a Non-Nuclear Power." In *Proceedings of the Conference on Peace in Asia*. Winter 1972-1973. In Japanese.
- "Japan's Security: Balancing After the Shocks." *Foreign Policy*, no. 9 (Winter 1972-73): 171-90. Reprinted in *Great Issues of International Politics*, edited by Morton A. Kaplan. 2nd ed. Chicago: Aldine Publishing Co., 1973.
- "Nuclear Threats and Allied Response." In *Proceedings of the European American Workshop*. Washington: Atlantic Council, March 1973.
- Aftershocks in Japan: Balancing the Bomb and Other Explosives*. Monograph. Santa Monica, California Seminar on Arms Control and Foreign Policy, 1973.
- "Threats and Promises of Peace: Europe and America in the New Era." *Orbis*, 17, no. 4 (Winter 1974): 1107-44.
- "Legends of the Strategic Arms Race: The Driving Engine." Monograph. Santa Monica: California Seminar on Arms Control and Foreign Policy, June 1974.
- "Is There a Strategic Arms Race?" *Foreign Policy*, no. 15 (Summer 1974): 3-20.
- "Rivals, But No 'Race'," *Foreign Policy*, no. 16 (Fall 1974): 48-81.
- Legends of the Strategic Arms Race*. Report 75-1. Washington: U.S. Strategic Institute, Fall 1974.
- "Alternatives to Mass Destruction as a Deterrent." In *The Military Dimensions of Foreign Policy*, vol. 2 of *Pacem in Terris III*, edited by Fred Warner Neal. Santa Barbara, Calif.: Center for the Study of Democratic Institutions, The Fund for the Republic, 1974.

- Methods that Obscure and Methods that Clarify the Strategic Competition* (principal author). Report to the Defense Nuclear Agency. Los Angeles: Pan Heuristics, June 1975.
- "Optimal Ways to Confuse Ourselves." *Foreign Policy*, no. 20 (Fall 1975): 170-98.
- Moving Toward Life in a Nuclear Armed Crowd?* (principal author). Report to the U.S. Arms Control and Disarmament Agency. Los Angeles: Pan Heuristics, April 22, 1976.
- "U.S. Nuclear Export Policy." Statement before the U.S. Congress. House. International Relations Committee. June 1976.
- "Racing Forward or Ambling Back?" *Survey*, no. 3/4 (Summer/Autumn 1976): 163-217. Reprinted in *Defending America*, edited by James Schlesinger. San Francisco: Institute of Contemporary Studies, 1977.
- "Spreading the Bomb Without Quite Breaking the Rules." *Foreign Policy*, no. 25 (Winter 1976-77): 88-96 and 145-79.
- "Möglichkeiten zur Verlangsamung und Begrenzung der Ausbreitung von Nuklearwaffen." *Europa Archiv* 32, no. 8 (April 25, 1977): 234-48.
- "The Spread of Nuclear Bombs: Predictions, Premises, Policies" (principal author). In *Can We Make Nuclear Power Compatible with Limiting the Spread of Nuclear Weapons?* Report to the Energy Research and Development Administration. Los Angeles: Pan Heuristics, May 1977.
- Town and Country Planning Act 1971*. Proof of Evidence of Albert Wohlstetter, Windscale Testimony. September 5-6, 1977. Reprinted as "Must We Decide Now for Worldwide Commerce in Plutonium Fuel?" In *Nuclear Policies: Fuel Without the Bomb*, edited by James Digby. A Policy Study of the California Seminar on Arms Control and Foreign Policy. Cambridge, Mass.: Ballinger, 1978.
- "The Military Potential of Civilian Nuclear Energy: Moving Toward Life in a Nuclear Armed Crowd?" (with Roberta Wohlstetter et al.). *Minerva*, 15, no. 3-4 (Autumn-Winter 1977): 387-538.
- "Varying Response with Circumstance" (with Henry S. Rowen). In *Beyond Nuclear Deterrence: New Aims, New Arms*, edited by Johan J. Holst and Uwe Nerlich. New York: Crane, Russak, 1977.
- Why and How the International Rules for Nuclear Technology Need Changing*. Report to the U.S. Arms Control and Disarmament Agency. Los Angeles: Pan Heuristics, April 1978.
- Nuclear Alternatives and Proliferation Risks* (with Gregory Jones). Report to the Department of Energy. Los Angeles: Pan Heuristics, July 1978.
- "Lifting the Embargo on Turkey." Statement. U.S. Congress. House. Committee on International Relations. *Foreign Assistance Legislation for FY 1979*, pt. 9, 1978.
- "The Strategic Importance of Turkey and the Arms Embargo." In *NATO, Turkey, and the United States Interests*, edited by Z. Michael Szaz et al. Washington: American Foreign Policy Institute, 1978.
- "Making Peace and Keeping It." *New York Times*. January 30, 1979.
- "Lesser Excluded Cases." *New York Times*. February 19, 1979.

- "The Uses of Irrelevance." *New York Times*. February 25, 1979.
- "Breeders and the Bomb." *New York Times*. March 14, 1979.
- "Can We Afford SALT?" *New York Times*. March 25, 1979.
- Swords from Plowshares: The Military Potential of Civilian Nuclear Energy* (principal author). Chicago: University of Chicago Press, 1979.
- "Meeting the Threat in the Persian Gulf." *Survey* 25, no. 2 (Spring 1980): 128-88. Reprinted by European American Institute for Security Research. EAI Paper no. 1, Report RS-11-1. Marina del Rey, Calif.: April 1981.
- "Half Wars and Half Policies in the Persian Gulf." In *From Weakness to Strength: National Security in the 1980s*, edited by W. Scott Thompson. San Francisco: Institute of Contemporary Studies, 1980.
- "His Defense Spending Will Help Redress a Perilous Imbalance." *Los Angeles Times*. March 22, 1981.
- "A Prescription for Disjointed Defense." *Wall Street Journal*. March 16, 1983.
- "Bishops, Statemen, and Other Strategists on the Bombing of Innocents." *Commentary* 75, no. 6 (June 1983): 15-35.
- "Morality and Deterrence: Albert Wohlstetter & Critics." *Commentary* 76, no. 6 (December 1983): 3-22.
- "NATO and Turkey after Detente." In *NATO in the 1980s*. Istanbul: Political and Social Studies Foundation (SISAV), 1983.
- "Armenian Terror as a Special Case of International Terror" (with Nancy Virts). In *International Terrorism and the Drug Connection*. Ankara, Turkey: Ankara University Press, 1984.
- "Staatsmänner, Bischöfe und sonstige Strategen über Bombenangriffe auf Unschuldige." In *Pro Pace*. Bonn: Deutsches Strategie-Forum, 1984.
- "Between an Unfree World and None: Increasing Our Choices." *Foreign Affairs*, 63, no. 5 (Summer 1985): 962-94. Reprinted in *Essays on Arms Control and National Security*, edited by Bernard F. Halloran. Washington: U.S. Arms Control and Disarmament Agency, 1986.
- "Arms Control That Could Work" (with Brian Chow). *Wall Street Journal*. July 17, 1985.
- "Die Türkei und die Sicherung der Interessen der NATO." *Europa Archiv* 40, no. 16 (August 25, 1985): 507-14.
- "Au Delà de la Stratégie du Pire." *Commentaire* 8, no. 39 (Winter 1985-1986): 1006-18.
- Self-Defense Zones in Space* (with Brian Chow). Los Angeles: Pan Heuristics, July 1986.
- "Continuing Control as a Requirement for Deterring" (with Richard Brody). In *Managing Nuclear Operations*, edited by Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket. Washington: Brookings Institution, 1987.
- "Political and Military Aims of Offense and Defense Innovation." In *Swords and Shields: NATO, the USSR, and New Choices for Long-Range Offense and Defense*, edited by Fred Hoffman, Albert Wohlstetter, and David Yost. Lexington, Mass.: Lexington Books, 1987. Expanded and reprinted in *The National Interest* 8 (Summer 1987): 31-57.
- "Overseas Reactions to Discriminate Deterrence." *The Atlantic Community Quarterly*, 26, no. 3 (Fall-Winter 1988): 234-46.

- "Morning of Prosperity in America: Own Data Misled Stagnation Prophets." *Wall Street Journal*. November 3, 1988.
- "Stability in a World with More than Two Countries" (with Stephen Prowse). In *Beyond START?* Policy Paper no. 7. San Diego, Calif.: University of California Institute on Global Conflict and Cooperation, 1988.
- "When Empires Are Falling, Daring Is Prudence." *Wall Street Journal*. December 12, 1989.
- "Economic and Security Policy in a Period of Drastic Change." *Chuo Koron*. Japan: June 1990.
- "Captive Nations and Western Security." *Wall Street Journal*. May 31, 1990.
- "Confronting Saddam: A Model Danger" (with Fred Hoffman). *Wall Street Journal*. August 9, 1990.

Declassified Book Length Studies

- Selection of Strategic Base Systems*. RAND Report R-244-S. Santa Monica, Calif.: RAND, March 1953.
- Selection and Use of Strategic Air Bases* (with Fred S. Hoffman, Henry S. Rowen, and Robert Lutz). RAND Report R-266. Santa Monica, Calif.: RAND, April 1954. Second printing June 1962.
- Protecting U.S. Power to Strike Back in the 1950s and 1960s* (with Fred S. Hoffman and Henry S. Rowen). RAND Report R-290. Santa Monica, Calif.: RAND, August 1956. Second printing 1968.
- Interests and Power in the Persian Gulf* (principal author) (partially declassified). 3 vols. Los Angeles: Pan Heuristics, 1981.

Bibliography: Roberta Wohlstetter

- Pearl Harbor: Warning and Decision*. Stanford, Calif.: Stanford University Press, 1962.
- Controlling the Risks in Cuba* (with Albert Wohlstetter). Adelphi Paper no. 17. London: International Institute for Strategic Studies, April 1965.
- "Cuba and Pearl Harbor: Hindsight and Foresight." *Foreign Affairs* 43, no. 4 (July 1965): 18-29.
- "Last Minute Magic." In *Great True Spy Stories*, edited by Allen Dulles. New York: Harper and Row, 1968.
- "Third Worlds' Abroad and at Home" (with Albert Wohlstetter). *The Public Interest* 14 (Winter 1969): 88-107.
- Private study in collaboration with Professor Nathan Leites of the University of Chicago on the personality of Fidel Castro as exhibited in his speeches, 1959-1972.
- "Kidnapping to Win Friends and Influence People." *Survey* 4, no. 93 (Fall 1974): 1-40.
- Moving Toward Life in a Nuclear Armed Crowd?* (with Albert Wohlstetter et al.). Report to the U.S. Arms Control and Disarmament Agency. Los Angeles: Pan Heuristics, April 22, 1976.
- "Terror on a Grand Scale." *Survival* 18, no. 3 (May/June 1976): 98-104.
- "The Nuclear Threat from Sub-National Groups." Monograph 13. Report to the U.S. Energy Research and Development Administration. Los Angeles: Pan Heuristics, April 1977.
- "The Military Potential of Civilian Nuclear Energy: Moving Toward Life in a Nuclear Armed Crowd?" (with Albert Wohlstetter et al.). *Minerva* 15, no. 3-4 (Autumn-Winter 1977): 387-538.
- "The Buddha Smiles: Absent-Minded Peaceful Aid and the Indian Bomb." In *Can We Make Nuclear Power Compatible with Limiting the Spread of Nuclear Weapons?* Report to the U.S. Energy Research and Development Administration. Los Angeles: Pan Heuristics, 1977. Reprinted as "U.S. Peaceful Aid and the Indian Bomb." In *Nuclear Policies: Fuel Without the Bomb*, edited by James Digby. A Policy Study of the California Seminar on Arms Control and Foreign Policy. Cambridge, Mass.: Ballinger, 1978.

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- Swords from Plowshares: The Military Potential of Civilian Nuclear Energy* (with Albert Wohlstetter et al.). Chicago: University of Chicago Press, 1979.
- "The Pleasures of Self-Deception." *The Washington Quarterly* 2, no. 4 (Autumn 1979): 23-34.
- "Slow Pearl Harbors." In *Intelligence Policy and National Security*, edited by R. L. Pfaltzgraff, Jr., Uri Ra'anana, and W. H. Milberg. London: MacMillan, 1981.
- Responding to Ambiguous Signals of Soviet Imminent or Future Power Projection* (coauthor). 3 vols. Los Angeles: Pan Heuristics, May 1982.
- Warning and No Response*. Los Angeles: Pan Heuristics, April 1985.
- Surprised by the Obvious*. Monograph. Washington: National Strategy Information Center, December 1988.

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