CHAPTER ONE

Contending Presumptions

In the fall of 1991, David Hamburg, then president of the Carnegie Corporation of New York, and Sam Nunn, then a U.S. senator from Georgia, convened a series of meetings to discuss the future of international security. They were impressed, as everyone was, by the precipitous ending of the cold war—just then being confirmed by the imminent dissolution of the Soviet Union—but they were already concerned about the aftermath. They were particularly concerned that the diffusion of the accumulated weapons arsenals and of their embedded technologies might produce a dangerous pattern of conflict. They believed that the United States would have a strong interest in controlling the dangers of weapons proliferation and would have to bear primary responsibility for doing so. They wanted to consider the implications.

In one of the many meetings held, an argument was advanced that the specific problems of proliferation could not be isolated from the general conditions of international security and that fundamental revisions of established practice would have to be contemplated as a new era emerged. The reasoning was that the historical pattern of belligerent confrontation between the major states could not continue indefinitely, not only because the inexorable spread of advanced technology would increase the risk to civilian society but also because the globalization of economic activity

was altering the nature of the security problem. Diffuse violence, it was suggested, posed a greater threat than traditional forms of mass aggression, driving even the most reluctant states into intricate collaboration for mutual protection. Classic notions of balancing power by means of active military deployments would have to be overlaid by more refined concepts of cooperation. Unavoidable disparities in raw military capacity would have to be constrained by explicit principles of equity, and those principles would have to be reinforced by agreed rules of procedure for force operations, rules that would be continuously practiced and actively monitored. The doctrine of deterrence—the major policy product of the cold war—would have to be subordinated to the countervailing idea of reassurance.

This argument envisaged a major shift in the organizing principles of international security. Under the established deterrent arrangement, security is based primarily on the active confrontation of military forces. If reassurance were to be established as the predominant principle, the active confrontation of deployed forces would be replaced by the continuous enforcement of collaborative rules designed to preclude military forces from being mobilized into an immediately threatening configuration. Deterrence as currently practiced involves the continuous presentation of an active threat. Reassurance would involve comprehensive restraint on such threats continuously documented in convincing detail. A shift in the degree of reliance on these basic principles would have to be undertaken, the argument maintained, not only to control proliferation but also to assure all other aspects of security under drastically altered circumstances.

In response to that argument, Senator Nunn, with a wry choice of phrasing, posed a skeptical question. "Well," he said, "you have human nature and all of history going against you there. What have you got going for you?"

The argument in question actually did not contradict all the results of history or every aspect of human nature. Strands of cooperation are deeply implanted in both, and indeed one could hardly have a major war without elaborate forms of cooperation within the military establishments of the opposing parties. Cooperation is arguably as integral to the human experience as battle. It is reasonable to consider how the balance of these different activities and the scope of their application might shift with changing circumstances. Nonetheless Senator Nunn's question undoubtedly reflected where the burden of proof did then and does continue to lie. Most of those engaged with the subject of international security, whether as direct participants or as attentive citizens, are acutely sensitive to the possibility of

willful attack. A solid majority in most societies is convinced that active preparation of national military forces provides the only reliable means of protection. This attitude is formulated in the self-labeled realist school of thought, which holds that security necessarily depends on the organized power of the nation-state and that states by their very nature compete with one another in the development of power to the extent they are able.[1] As a result, the staunch realists contend, any form of arranged security cooperation is less reliable than national military power.[2] Those who hold that view concede that the passing of the cold war produced many important changes in circumstance, but they do not believe that those changes altered the fundamental character of nation-states or of the security problems they generate. As a practical matter, that is the prevailing presumption, and it is up to those who question it to make a convincing case.

On broad questions of this sort, assigning the burden of proof is nearly always decisive as far as prevailing opinion is concerned. Those who are made to carry it generally lose the argument. In this instance it clearly would be extremely difficult to overturn the entrenched presumptions of the realist school whose origins can be traced, if not literally to all of human history, then certainly to prominent features extending back as far as there is documented testimony. From the earliest records of human societies, warfare has been both an organizing focus and a prime source of political motivation. The binding power of common threat and the closely associated impulse to control territory have had much to do with the rise of states, the justification of their governments, the genesis of armies, the development of technology, the evolution of manufacturing capability, and formation of the human attitudes that have accompanied all of these. Countless battles have been fought in the course of colonizing the planet. Hundreds of millions of individual lives have been expended. The experience has created a legacy of military confrontation that many people consider immutable, as the senator's question implied. Since preparations for war and the occasional conduct of it have been central preoccupations for virtually all the major states throughout their existence, it is widely assumed that the pattern is rooted in human nature and that it will endure indefinitely.

But security practices clearly are not immutable in every important respect. And as consequential as prevailing opinion unquestionably is, it is not the only consideration of importance. Although the full implications are still obscure, it is increasingly apparent that contemporary societies are encountering a major deflection in the course of their development, as

illustrated dramatically by the manner in which the cold war ended. That was largely a spontaneous event, surprising virtually everyone who experienced it, including the political leaders most intimately involved. No one seriously anticipated the reunification of Germany, the dissolution of the Warsaw Treaty Organization, or the dismemberment of the Soviet Union until just before those events occurred. In the aftermath there has been a natural inclination, particularly in the United States, to interpret this good fortune as an episode in the triumphant extension of market democracy, but it is prudent to question whether that will prove to be the full story. Since no one could anticipate either the timing or the scope of what happened, no one can claim to grasp all of the consequences either. The massive transformation that has engulfed the Soviet Union and its Central European allies suggests the workings of very large forces capable of doing far more than settling an ideological quarrel. If that can happen in one part of the world, it may be happening in all of it, and the process may be far from complete. The specific security implications presumably will not overturn all that history has done, but they might well prove to be far more extensive than currently imagined, especially by adherents of the realist perspective. Exploring that possibility is appropriate, even urgent, and it is the central purpose of this book.

Discontinuity

For those willing to undertake such an exploration, the hint of a general transformation in progress is a natural place to begin, and there are some strong clues about the underlying forces that might be driving such a process.[3] It has something to do, one can surmise, with trends in the capacity for violence. In absolute terms the past century has been the most destructive in history, with more than 100 million people killed and a commensurate amount of physical damage done through various forms of warfare.[4] But that record is eclipsed by the technical potential for destruction, which already has reached unprecedented magnitude and is on the verge of reaching unprecedented intrusiveness. As the principal activity of the cold war, military forces were developed to the point at which they could directly slaughter tens of millions of people within a few hours and so devastate the infrastructure of major societies that hundreds of millions and perhaps billions of other people would be at grave risk. Political attitudes have so accommodated that development that it is not now considered remarkable and, with the proclaimed passing of the cold war, not even especially

relevant. The capacity for rapid destruction on that scale imposes relentless pressures on fallible human institutions, however, and simple common sense suggests that the cold war pattern of nuclear weapons deployments cannot be sustained in a safe manner indefinitely. Some major transformation in the handling of this capability can eventually be expected.

The potential for mass destruction is not the only source of unusual pressure, moreover. The capacity for precise attack at very long range is developing to the point that forms of coercion could be undertaken that have never been feasible before. In all of history up to this point, killing a king and sacking his headquarters first required defeating his protective armies. It will soon be feasible to accomplish this directly at any moment from any location. If that capability matures to its full potential and diffuses throughout the world, critical assets of all societies will be continuously exposed to dedicated attack from anonymous sources. Even the possibility of this threat means that advanced rules of restraint will have to be devised if normal daily life is to be protected.

But the enhanced capacity for violence is not the only and probably not even the primary agent of social transformation. It is based on a technical revolution with implications much broader than the conduct of warfare. It also is set in the context of what necessarily will be a unique moment in history—an unprecedented surge in the total human population. Whatever else might be happening, the combined effects of technology and population dynamics are altering some of the critical operating conditions of human societies, are creating unusual pressures within them, and appear to be inducing a new pattern of interaction among them. One of the many consequences of this situation is the emergence of fundamentally different security problems. Correspondingly fundamental changes in the practice of war, or what is now more politely called international security, can be expected to follow.

Technology

A sense of historical discontinuity produced by radical technical change was, of course, a prominent feature of the cold war itself. That sense emerged with the revelation in the final stages of World War II of what were then called atomic weapons, and it became a continuous theme in the extensive effort to comprehend their implications. The point was forcefully expressed in a memorandum written on September 11, 1945, by U.S. Secretary of War Henry L. Stimson to President Harry S. Truman:

> If the atomic bomb were merely another though more devastating military weapon to be assimilated into our pattern of international relations, it would be one thing. We could then follow the old custom of secrecy and nationalistic military superiority relying on international caution to prescribe the future use of the weapon as we did with gas. But I think the bomb instead constitutes merely a first step in a new control by man over the forces of nature too revolutionary and dangerous to fit into the old concepts. I think it really caps the climax of the race between man's growing technical power for destructiveness and his psychological power of self-control and group control—his moral power.[5]

The same thought was summarized two decades later by Albert Einstein in one of his most widely noted remarks: "The unleashing of the power of the atom has changed everything but our modes of thinking, and thus we drift toward unparalleled catastrophes."[6]

The "everything" that Einstein had in mind concerned the energy densities that his conceptual advances had enabled. With mastery of the contributing technologies, it became possible over a two-decade period to increase the explosive yield of a given amount of weapons material by a factor of a million. With the mastery of ballistic missile technology, it became possible to deliver nuclear explosives over intercontinental ranges at speeds more than forty times greater than the aircraft of World War II were able to achieve and to do so with sufficient precision to bring the destructive effects to bear on intended targets with very high confidence.[7] But contrary to Stimson's plea, those accomplishments were applied to standard missions of warfare and were assimilated to the traditional pattern of international relations. Two contending alliances arose, each imagining that the other might use the new technology to initiate a massive assault without notice. Each alliance spent large sums preparing to apply the new weapons to the massive ground assaults and strategic bombardments characteristic of World War II. The physical calculations that supported the technical achievements made it possible to measure the destructive implications of these more advanced forms of warfare with enough precision to provide an indisputable and riveting depiction of threat. The clarity and the magnitude of nuclear weapons effects crystallized a conception of international security based on a confrontational balance of opposing forces, and that conception became the organizing formulation of international security.

If nuclear weapons and ballistic missiles were the most prominent and most destructive technical developments of the period, however, they were not the most radical. Intertwined in their development was a series of even greater technical advances involving the efficient handling of information. Over a five-decade span, the costs of storing a unit of information, processing it in some useful application, and transmitting it over long distances have declined by factors of up to 100 million or more and are projected to continue declining for at least another decade.[8] In the earliest stages these achievements were driven by weapons applications, but the primary impetus shifted rapidly to the development of consumer products and a wide range of commercial services. The consequences of the technologies themselves and of their distinctive pattern of development are more diffuse and much less readily calculated than the consequences of a millionfold increase in the energy density of explosives, but they clearly have much broader scope. In fact they affect virtually all forms of organized human activity.

Although the literature dedicated to information technology articulates a strong sense of historical discontinuity that could be assimilated readily to Einstein's remark, as yet no crystallizing image of threat or of any other identifiable consequence has provided the organizing focus for policy that nuclear weapons effects provided for the cold war era. Nonetheless it is evident that massive efficiency gains in the handling of information are capable of bringing about truly fundamental changes in core activities of human societies, and it is plausible that they will actually do so. Vastly facilitated information flows make it feasible, for example, to organize basic economic functions on a global scale, and market forces appear to be mandating it. That is most evident to date in the operations of capital markets whose accelerating international growth in recent years gives evidence of historical discontinuity. Discontinuity is less evident in the figures for trade and for direct foreign investment, but these indicators do show a trend of increasing activity across national boundaries. If basic manufacturing and the provision of services are eventually driven to global scale to the extent that is technically feasible, then a progressively integrated international economy will emerge with properties that diverge sharply from past experience.

Rapid shifts in the structure of employment would be expected to occur in such an economy as individuals and firms learn how to use information technology. The national identity of all economies would also be diluted as the leading entrepreneurs adapt to the imperatives of organizing across

cultural divisions. National governments would not be able to prevent these effects without disrupting economic performance, nor would they be able to stimulate or regulate economic performance by the standard methods of macroeconomic management. Since a spontaneously integrating international economy would generate universal incentives and would require universal operating rules, it would drive national governments into ever more intricate forms of collaboration in an effort to pursue national economic objectives. It also would disperse access to products, information, and technology of all sorts—some of them distinctly dangerous—and would intensify interactions among separate cultures. In general it would tie everyone's fate to everyone else's to an extent never experienced before.

At the moment it cannot be indisputably demonstrated that a global economy of this sort is actually emerging, but that is certainly a strong possibility.[9] The sheer efficiency with which information is handled makes it so.

Population Dynamics

The companion phenomenon of population dynamics has not captured strategic imagination to the extent that nuclear weapons and information technology have, but its significance is at least as great if not more so. In the aftermath of World War II the overall size of the human population began a process of accelerated increase typically associated with an exponential growth sequence before reaching some limiting condition. Although substantial uncertainties are involved, standard estimates suggest that the total number of human beings alive on earth first reached 1 billion around 1800; that is, it had required all of human history up to that point to generate a total population of that size. The second billion was added about 125 years later, the third thirty years after that, the fourth fourteen years later, the fifth thirteen years later, and the sixth twelve years later in 1999.[10] As Nobel laureate nuclear physicist Murray Gell-Mann has pointed out, this sequence can be fitted to a parabolic curve that explodes to infinity in the year 2025.[11] We know that limiting conditions will be encountered well before that happens, and the limiting process is already visible. Birth rates are declining in most parts of the world. The demographic momentum that has been established, however, will sustain for several more decades the surge in growth that began around 1950. Barring some cataclysm, about 8 billion people will be alive in 2025, an increase of 1 billion people every fourteen to fifteen years over that span of time.[12] The trajectory thereafter is more speculative, but United Nations mid-range

estimates—the best approximation of consensus on the subject—suggest eventual stabilization at the level of 10 billion or so.[13]

The composition of this population surge is as important as its magnitude. The increases are not occurring proportionately across the spectrum of income and wealth. Virtually all of the projected increase is expected to occur in the poorest segments of the population—those falling in the lowest 20 percent of the distribution of income and wealth.[14] That pattern differentiates the more advanced economies—members of the Organization for Economic Cooperation and Development (OECD)—from all of the others, but the same pattern also occurs within the developed economies. Throughout the world the wealthier populations are already at or below replacement levels of fertility, and the net increases are occurring almost entirely among the lowest-income groups.[15] In addition to altering the income distribution, this phenomenon also affects the age structure of the population, generating disproportionately large age cohorts that produce a corresponding pattern of surge and decline in the demand for basic requirements—education, housing, employment, consumer durables, and eventually health and retirement benefits—as they move through the life cycle. Sharp differences have emerged in the age structures of different societies, with the populations of the developing economies as a whole significantly younger than those of the industrial economies.[16]

The potential consequences of these distributional patterns are very large indeed, particularly in interaction with the consequences of information technology. So far it appears that the process of economic growth associated with the adaptation to information technology is concentrated in the leading sectors of the advanced economies, as would be expected. Those who are more sophisticated and have greater access to capital are undertaking the technical advances and are learning more rapidly how to capture the economic advantages provided. That appears to be the case in the United States, at least, which also appears to be the society that is farthest along in the process of adaptation. For more than two decades, the benefits of economic growth in the United States have been concentrated at the top of the income spectrum. There has been stagnation in the middle parts of the spectrum and decline at the bottom. Between 1979 and 1996 the average annual income of males in the lowest 20 percent of the wage distribution in the United States declined 19 percent, while wage income of the top decile increased 10 percent.[17] Comparable figures for family wages over the same seventeen-year period declined 11 percent for the bottom quintile and increased 14 percent for the top quintile.[18] Expe-

rience over this period has been roughly comparable in the other OECD countries as well. It may be that, as the process of adjustment to technical change proceeds, the economic benefits will become more widely distributed. If that does not occur naturally, there will be exceedingly strong pressures to make it happen by design. It is difficult to imagine that social coherence could be preserved decade after decade with economic growth occurring at the top of the prosperity pyramid and population growth at the bottom. Those societies that do not produce a more equitable pattern of development will be in serious trouble, and the world as a whole will be in serious trouble if too many societies fail to achieve whatever standards of equity are necessary to preserve their coherence.

The economic implications of this fundamental requirement are extremely demanding. Simple redistribution policies could not achieve an acceptable outcome. There are too few rich and too many poor for any feasible amount of generosity in the form of income or wealth transfers to solve the problem. Adequate standards of equity will have to be achieved through broadly distributed growth, and some imposing numbers can be derived from that fact. Improving standards of living in the rapidly expanding population base will require a tripling of energy production over five decades even if unprecedentedly large efficiency gains are realized. It also will require a doubling of food production. Both accomplishments will have to be done in an environmentally tractable manner, at least in the minimum sense that the effects are not locally so rapacious as to preclude the production increases required or globally so destructive as to make the consequences intolerable. In some regions with large population concentrations—China and India in particular—it is doubtful that even that minimum standard can be achieved on the basis of current technology. The investment required to develop alternatives within the time period required is not in place. Neither of these societies could manage an investment of that pace and magnitude with its own resources exclusively, and a global process of investment that responds to the problem has not yet been organized.

This, then, is the new strategic environment. Human societies are undergoing a monumental transformation affecting their most basic features. That transformation will have major implications for most areas of public policy, indeed most organized activity of any sort. But as one of the more prominent of the expected consequences, the ancient art of war embellished by the modern practice of security will probably blend into yet larger subjects—the pursuit of global economic prosperity, the provision of so-

cial welfare, the general management of violence, and the engagement with the fundamental processes of nature. By implication, the effective protection of any society against various forms of violent assault and the broader defense of its interests will involve more than the deployment of standard military forces to perform traditional missions. The performance of these missions will be affected more directly by matters that historically have been considered background circumstances—education, commercial investment, and public health, for example—and anything else on which basic social coherence might depend. New issues of security can be expected to arise, and to the extent that they are genuinely new they will be difficult to anticipate. The long-recognized issues of security that can be anticipated will be profoundly altered. Necessary adjustments to deeply established security practices may well prove to be even more difficult than accommodation to the entirely unfamiliar. Both the scope and the time scale of consequence in this emerging situation are substantially greater than they have ever been, and that fact creates a mismatch with the capabilities of human institutions as they have evolved to date. We simply do not understand the full implications of the momentum that human societies have acquired. As one of the many reflections of that fact, no decisionmaking mechanisms operate with the multiple-decade, substantively integrated perspective necessary to visualize either the major strategic dangers or a comprehensively desirable outcome. The human enterprise is largely blind to the destiny it is creating.

Given this massive uncertainty, a valid and broadly accepted conceptualization of international security probably will not emerge to replace the cold war formulation for quite some time, if ever. But that, of course, will not suspend the process of transformation. Even in a complete vacuum of conscious purpose, that process can be expected to reshape the legacies of the cold war and of the deeper history of warfare in general, perhaps as profoundly as glaciers reconfigure the earth's surface or as internal convection moves the continents around.

Unsustainable Legacies

It is not a trivial matter to determine what the most consequential of these legacies are or to judge which of them will be subjected to the greatest pressure in the emerging situation. That task involves disputable interpretation rather than simple observation. Moreover, it is much easier to recognize an evolutionary adaptation after it has occurred than to predict it

in advance. Nevertheless, there are some fairly obvious presumptions, and the obvious is not always wrong. The cold war process produced a volatile configuration of military forces with embedded dangers that were suppressed in the heat of confrontation. It also produced an inequitable distribution of military power and a process of technical diffusion capable of generating some unmanageably perverse effects. These three conditions cannot be sustained simultaneously and indefinitely. One can anticipate that a volatile and inequitable international security arrangement will be eroded by the process of technical diffusion and eventually will have to be redesigned.

Volatility was a natural consequence of technical development, but not an entirely inevitable or irreversible one. Nuclear weapons, jet aircraft, ballistic missiles, and information technology gave tremendous impulse and global reach to offensive military operations. When assimilated to the aggressive blitzkrieg doctrine that Germany had used so effectively in World War II, these innovations led quite naturally to a pattern of deployment in which the major military establishments continuously prepared for large-scale operations on very short notice. The underlying supposition was that the primary threat originated from aggressive intent and that advanced technology would enable decisive results to be achieved by surprise attack. The lesson derived from World War II was not that the aggressors ultimately were defeated, but rather that they nearly won in the initial phase.

This line of development produced a new phenomenon in the history of warfare. Prior to World War II military establishments were preserved in skeletal form in peacetime and mobilized their combat capabilities only in the case of immediately intended use. As the cold war configuration emerged, they set, and largely achieved, a much higher standard of preparation. For ground force and naval units, it could be argued, the more advanced pattern was an evolutionary extension of what counterpart forces had accomplished prior to World War I, but there clearly was no precedent for the degree of readiness embodied in nuclear weapons operations or in the most advanced tactical air units. Contemporary nuclear forces are prepared to initiate an attack on thousands of targets at intercontinental range within half an hour of receiving an authoritative order to do so and to complete the attack within a few hours. Under routine conditions, contemporary tactical air units are prepared to act in a matter of days rather than hours, but for most of the locations where a serious military engagement could occur, that would be a small number of days. This abil-

ity yields an intimidating deterrent but also a threatening offense poised for assault. This configuration of forces discourages deliberate aggression quite decisively but also enables a massive accident to occur. This possibility is a problem serious enough to induce a substantial change in operational practice, whether or not an accident does occur.

The issue of equity became far more visible in the aftermath of the cold war than it was during the course of it. With the advantage of retrospect, it seems evident that it was a major factor from the outset. The two contending alliances that waged the central confrontation did not at any time have a stable balance of assets or exposure. The Soviet Union was pitted against all of the industrial democracies but could not match their combined economic and technical base. By virtue of geography it also was much more vulnerable to conventional arms engagements, dramatically so in comparison with the United States. It managed to compete in the development and deployment of nuclear weapons, ballistic missiles, and to a lesser extent tactical aircraft. It did not keep pace in the critical area of information technology, however, and fell progressively behind in the derived capacity to perform the more sophisticated command functions and to engage in high-precision operations. Moreover, the burden of the Soviet defense effort seriously distorted the composition of the economy and contributed to the crisis of economic performance that ultimately undermined the entire political system.[19]

With the dismemberment of the Soviet Union, an obvious and overwhelming imbalance in assets emerged. As indicated in table 1-1, the levels of annual investment in military equipment sustained by the United States and its principal allies far exceed even the most generous estimates of what the other major military establishments allocate to that purpose. As a result, members of the U.S. alliance system have a capacity to perform traditional military missions that no outside military establishment can match. In those terms, at least, they enjoy a higher standard of security than the rest of the world.

By contrast, a tremendous security burden was imposed on Russia, as an assertive heir to the major part of the Soviet military establishment, including the entire nuclear weapons component, and as a much more reluctant heir to Soviet political history. Russia absorbed an oversized, poorly maintained, and inappropriately configured military force that had to be relocated from the territory of former allies and other Soviet successor states. Along with that inheritance came the residue of antagonism and suspicion that the Soviet Union had inspired, the most significant con-

Table 1-1. *Annual Investment in Military Capability, 1998*

Country	*Annual investment (billions of U.S. dollars)*
United States	90.3
NATO (without United States), Japan, and South Korea	61.9
Russia	4.8–15.0
China	3.7–15.0
Iraq	< 1.0
North Korea	< 1.0

Source: Author's estimates based on International Institute for Strategic Studies, *The Military Balance, 1998–1999* (Oxford University Press, 1998), and John D. Steinbruner and William W. Kaufmann, "International Security Reconsidered," in Robert D. Reischauer, ed., *Setting National Priorities: Budget Choices for the Next Century* (Brookings, 1997), p. 158. Figures for U.S. investment are from International Institute for Strategic Studies, *The Military Balance*, p. 15. NATO (without the United States), Japanese, and South Korean investment is estimated to be 30 percent of total defense spending. For Chinese and Russian investment, a range is listed because of the great discrepancy between official military budget figures and international estimates. The range of Russian investment is drawn from International Institute for Strategic Studies, *The Military Balance*, pp. 104–05. For China, the low-end figure is 33.7 percent of the official defense budget (derived by assuming that China matches the percentage of the U.S. military budget devoted to investment). The high-end Chinese figure comes from Steinbruner and Kaufmann, "International Security Reconsidered," p. 158. The estimates for Iraqi and North Korean investment are from International Institute for Strategic Studies, *The Military Balance*. For either country, it is implausible to imagine military investment figures over $1 billion.

sequence of which was a deeply established presumption that Russia would not be eligible to join the predominant alliance system. Caught up in a massive economic transformation of overriding priority, Russia has not been able to finance its inherited military establishment at the rate that would be required to sustain it, let alone make it competitive.[20] As a consequence, its capacity to perform legitimate military missions is deteriorating, as is its ability to assure managerial coherence. The internal deterioration of the Russian military establishment laboring under conditions of inferiority poses dangers that are distinctly different and much greater than any residual inclination or capacity it might have for external aggression. Those dangers are a new, unavoidable, and as yet unresolved problem of international security. They are not confined solely to the Russian military establishment.

The third troublesome legacy—the process of technical diffusion—always has been a feature of military interactions, but one that clearly is being enhanced not only by the effects of information technology but also more generally by the remarkable surge of modern science as a whole. Weapons developments emerge from basic science. The fundamentals of science are necessarily accessible to all human societies and in principle to

all individuals. The methods used to control access to specific weapons applications—security classification, export licensing, and similar regulatory restrictions—can be effective for some period of time, but they do not establish impermeable barriers. The inventions of any society eventually can be emulated or appropriated by any other society that makes a dedicated effort to do so, and the process of globalization clearly is diminishing the amount of time and effort required. Enhanced information flows, the extensive commercialization of basic technical development, and the competitive efforts of weapons producers to export their products have facilitated access to advanced weapons technology to the point that, in principle, any major innovation can be expected to be broadly available within a decade or so. Policies of restriction and disparities in the magnitude of investment undoubtedly can sustain for longer periods of time the advantages in the scale of advanced weapons deployment that the United States and its allies have established. But they cannot preserve an absolute qualitative monopoly. Nuclear explosives, biological pathogens, lethal toxins, chemical agents, and the basic components of precision delivery all can be acquired by smaller states and other organizations that would not have the capacity to develop them independently. This access and the incentive to use it to offset the advantages of the preponderant military establishments create pressures that in principle could force substantial innovation in the practice of international security.

Formative Problems

The extreme difficulty of deriving a valid and broadly accepted strategic conception for the new set of circumstances probably means that the process of adaptation will occur gradually in the course of dealing with specific problems whose immediate implications are evident, even if their extended consequences are not. As a practical matter the problems that come to play this formative role are likely to have a significant effect on the ultimate outcome. Some of these are predictable. Others will emerge from events that cannot be anticipated. Basic understanding of the process of adaptation and efforts to shape it both rest, somewhat precariously, on the more predictable and more enduring of these specific problems.

Sustaining Traditional Missions

The most predictable of these problems has to do with continuation of the basic military missions that were the focus of investment throughout the cold war era. These can be summarized broadly as deterring nuclear

war, preventing hostile incursion into sovereign territory or air space, and protecting legitimate use of the seas. Most of the effort of the major military establishments—the design and purchase of equipment, the organization of units, the pattern of deployment, the training of personnel, the development of operational doctrine, and the integration of all these components into readily available combat capability—is designed to perform these core missions and to do so on short notice against a comparably configured opponent. The central principle of countervailing military power directed against deliberately calculated mass aggression survives the end of the cold war and is supported by the political emotions and institutional commitments derived from historical experience. Within the United States, which operates the most capable military establishment and thereby sets the standard for the rest of the world, the official defense plan projects an indefinite continuation of this basic pattern.[21] The resources to do so clearly are available, if the political will to spend them in this way is itself sustained. Entrenched as it is, however, that commitment will be subjected to the corrosive effects of the new strategic circumstances.

The primary fact is that there is no plausible opponent to justify advanced states of readiness for undertaking traditional missions on a large scale and with short notice. It would require at least two decades of investment and probably more for any military establishment outside the U.S. system of alliances to match the capabilities of the United States alone. No country is attempting such an effort, and despite continuing rhetorical popularity of great power logic, there is very little reason to do so. The massive assaults that underlie mission conceptions derived from the major wars of this century have lost much of the incentive that once motivated them. Quite apart from the high probability of ruinous defeat, major exercises to seize and hold territory and to impose jurisdiction by force cannot be consolidated in a globalizing economy and an increasingly interactive culture. Basically it is too expensive to rule principally by force, and political jurisdiction therefore depends on establishing legitimacy. In instances of divided societies where the affected population might conceivably ratify political jurisdiction acquired by force—on the Korean peninsula, for example, or Taiwan—active vigilance clearly is justified and is being practiced. But the sum total of these instances is not sufficient to sustain a general pattern of confrontation. The overriding incentive for the major military establishments and their supporting societies is to preserve their traditional mission capabilities at less expense in order to direct investment to the newer and broader dimensions of security. The concern for

greater efficiency mainly affects the United States, Russia, China, and, to a somewhat lesser extent, India. These countries are emerging from the experience of the century with the largest military establishments operating in a pattern of implicit confrontation. They have strong reasons to establish the forms of collaboration that would enable the traditional missions to be performed reliably at lower levels of force deployment.

When translated into practical terms, this incentive for greater efficiency intersects the independent interest in establishing an inherently safer and less volatile pattern of deployment. Even though the traditional military missions are universally articulated in terms of defensive intent and even though there is no reason to doubt the sincerity of those intentions, the configuration of forces that has emerged from the cold war era overwhelmingly emphasizes offensive operations. This fact is embodied most prominently in the U.S. military establishment, which, again, sets the international standard. Facing no conventional threat of significant size to the United States itself, American forces are organized to project power on a global scale. They are deployed in defense of allied territory, and it is unlikely that they would initiate an unprovoked massive assault against any other country. Nonetheless, in any major engagement in which they are involved, they would conduct extensive tactical air attacks against the entire infrastructure of an opponent's military capability, as demonstrated during the 1991 Persian Gulf war and the 1999 air campaign against Yugoslavia. In conducting limited tactical air attacks against Libya in 1986 and against Afghanistan and the Sudan in 1998, the United States established its willingness to engage in unilateral reprisal against states judged to have sponsored terrorist actions.[22] Air strikes against Iraq in 1993 and 1998 extended the doctrine of reprisal to political provocations not involving immediate acts of violence.[23] The combined-arms assault on Panama in 1989 was essentially a military operation to enforce U.S. drug laws.

This record of assertive military action creates an incentive for countries outside the U.S. alliance to develop some form of countervailing capability. Unable to match or defend themselves against U.S. offensive operations, countries that are or might be entangled in any serious political dispute have reason to seek a countervailing deterrent, and the inexorable diffusion of technology provides ample scope of opportunity. Nuclear explosives and precision strike technology both provide feasible means of disrupting the offensive operations of a superior military establishment. The implications of that fact are likely to shape the evolution of security relationships with the smaller dissident states such as Iran, Iraq, Libya,

and North Korea and potentially with larger ones as well. The process of globalization would appear to encourage changes in conception and in policy on both sides in all of these confrontational relationships.

The dangerous dynamics generated by unbalanced deterrent relationships can be alleviated if those caught up in them concede the legitimate defensive objectives of the other party and systematically reassure each other that those purposes will not be contested. Over the course of the cold war the United States became adept at the practice of systematic reassurance as it transformed its World War II enemies into major allies. The emerging situation gives powerful incentive to extend that legacy both to the major cold war enemies and to the smaller dissident states—an implication resisted in practice but feasible in principle. One of the most fundamental implications of globalization is a shift in the balance of reliance in security policy from deterrence to reassurance, from active confrontation to cooperative engagement, as envisaged in the argument that provoked Senator Nunn's question.[24] The incentives to undertake this shift are realistic in character, and they operate across the entire spectrum of cultural and political inclination. Quite apart from rhetorical labels, it is unrealistic to imagine that any of the national military forces could provide reliable security without relying on any formal cooperation whatsoever. Not even the strongest states, including specifically the United States, have ever had or could plausibly acquire sufficient capacity to operate under that extreme formula. Various forms of organized cooperation always have been a necessary element of state security, and the most secure states are the ones that systematically have developed that aspect of the practice. The practical issue is the relative balance of self-reliance and cooperation.

Containing Civil Conflict

It is prudent to expect that civil violence will become a more serious international security concern under the new strategic circumstances than it has been. Since World War II many more people have been killed in internal conflicts than in the type of engagements between states that have been the principal focus of security policy and active military preparation. Since this form of violence has occurred largely in societies that have been relatively isolated from the developing international economy and has not spread visibly beyond those societies, it has not been considered a matter of primary concern for the international community as a whole. Mass violence resulting from the political separation of India and Pakistan, for

example, from internal repression in Mao's China and Pol Pot's Cambodia, from protracted civil wars in Afghanistan, Angola, El Salvador, Mozambique, and the Sudan, and from the disintegration of coherent government in Bosnia, Kosovo, Rwanda, and Somalia has been treated as a local tragedy rather than a general threat. These and other episodes have reflected a presumption of tolerance that probably will be revised significantly as the consequences of globalization are better appreciated, even if it is not reversed. Intensifying economic interactions and the pattern of inequitably distributed growth associated with them increase the possibility that major instances of sustained civil violence will themselves interact more consequentially. In particular, some critical number of these instances occurring simultaneously might undermine the basic legal standards necessary to operate the globalizing economy. The killing that occurs in episodes of massive civil violence is done by organizations operating outside the bounds of normal legal standards, and those organizations are themselves increasingly capable of extending their operations on a broader scale. What they do to arm and finance themselves stimulates criminal activity generally, and the international community will have to be more concerned with this effect than it historically has been.

The spectrum of concern in this regard runs from overt civil conflicts in which organized militia equipped with conventional military weapons prey on civilian populations that are not protected by any regular military establishment to terrorist campaigns directed against populations whose military protection can be penetrated clandestinely. There are many variations within the spectrum, but the unifying fact is that spontaneous violence emerging from the sustained breakdown of a legal system and organized violence undertaken by intensely disaffected political groups both can cause mass casualties comparable to those caused by formal warfare. The potential to do so appears to be increasing, moreover, with the diffusion of weapons technology and the weakening of basic social coherence in many parts of the world. A military establishment prepared for traditional forms of warfare can readily suppress any particular militia operation, if it chooses to do so. With a more difficult and more sustained effort, it eventually can control any given terrorist operation as well. A global epidemic of either type of violence would be completely unmanageable, however, and that possibility cannot be dismissed in a world of intensifying interaction. As even the leading societies are forced to contend with the threat of civil violence, the weight of effort in international security can be expected to shift from the practice of deterrent confrontation

devised for traditional military engagements to the methods of systematic prevention that are the only feasible means of containing the epidemic potential of such violence.

Managing Interactions with Nature

It seems apparent, however, that the most extensive reformulation of security interest eventually will emerge from the need to contend with the environmental consequences of expanding human activity. Even before the population surge has run its course, the aggregate effects of human production have reached levels that conceivably might affect the most fundamental operations of nature necessary to sustain life. The composition of the atmosphere, for example, is not in stable equilibrium and might be altered dramatically by catalytic changes that human beings as a whole unwittingly introduce. Similarly the pattern of ocean currents to which climate conditions in Northern Europe are especially sensitive is susceptible to radical shifts that also might be triggered by small changes in critical parameters. As yet no specific phenomenon of this sort has been demonstrated with the compelling clarity attributed to nuclear weapons effects, but the potential consequences are even greater. Although nature is not a calculating enemy capable of organizing deliberate aggression, it occasionally produces cataclysmic events capable of devastation far beyond what any form of warfare might do.

To date the most prominent concern about global environmental effects has centered on the anticipated phenomenon of global warming—an increase in average temperature at the earth's surface caused by an accumulation of those gases in the atmosphere that absorb and re-emit radiated energy. It is well established that two of the compounds that have this effect—carbon dioxide and methane—have increased more than 30 and 100 percent, respectively, since 1800, the point at which large-scale human industrial activity began to develop.[25] Since carbon dioxide is retained in the atmosphere for lengthy periods of time and since substantial rates of emission are certain to continue through the decades of rapid population growth, human society will generate some warming effect on the earth's atmosphere for more than a century to come. The net magnitude of the effect is uncertain and hotly disputed, as are the expected consequences. The officially estimated range, however, is comparable in size and ten times more rapid than the temperature shift associated with the last Ice Age some 18,000 years ago.[26]

This fact alone has tremendous strategic significance. It provides direct evidence that aggregate human activity has reached the historical juncture at which cataclysmic shifts in global environmental processes might be triggered. And that possibility, in turn, imposes what promises to be the central dilemma of the era: if human societies wait until decisive evidence of global environmental danger has accumulated, it probably will be too late to avoid; if they act in mistaken anticipation, they could seriously misdirect their efforts. An unresolved tension between these potential errors of judgment stands in the background of many specific issues. Were the balance to be shifted by some scientific result or crystallization of opinion, a new formulation of international security could rapidly emerge. If a global environmental threat is ever visualized with sufficient clarity, either validly or otherwise, it could have an organizing influence comparable to or greater than that of nuclear weapons.

It also is possible, and even more likely, that environmental interactions in particularly sensitive regions will acquire an organizing significance comparable to the major points of conventional force engagement that provided the basic contingencies for military planning during the cold war. In some areas of the world, high population densities are seriously burdening local soil and water resources—northern China and East Africa in particular.[27] Those areas will experience earliest and most intensely the problems of managing resource scarcity that, with the general population surge, will be related increasingly to the problem of preventing civil violence. Although the connection among resource scarcity, economic austerity, and civil violence is difficult to demonstrate with historical evidence and involves subtle interactions that are not yet fully understood, the violence that engulfed the Great Lakes region of Africa following the outbreak of mass murder in Rwanda in 1994 suggests that something more fundamental was at work than the political personalities who dominated most of the news reports.[28] The interaction between resource scarcity and principles of equitable allocation is one of the most likely to occur. To the extent that a general problem is recognized, the leading instances will command systematic attention.

Implications

In summary, then, there is good reason to believe that the evolving practice of international security will not be a simple, not necessarily even a recognizable, extension of historical experience, as weighty as that experi-

ence has been. Sharp discontinuities in the determining conditions of human societies and in the nature of the problems being presented can be expected to induce fundamental revisions in all of the major elements of the topic—in the guiding principles of strategy, in the deployment patterns and operational configuration of military forces, in the principal missions to which they are directed, in the alliance arrangements that set the basic patterns of allegiance, and in the methods used to regulate the diffusion of weapons. And the ability to undertake the necessary adjustments will be a test of the viability of all forms of government, especially the ascendant democracies. These are not matters that can be settled by an anointed few acting in secrecy. They require broadly based judgments from entire political systems, and the systems primarily in question are being driven by the process of globalization into degrees of engagement and forms of collaboration that none of them is prepared to welcome. It is a human drama in the broadest sense of the term.

Since it will not be possible to understand the full implications of globalization anytime soon, the drama will unfold as a story of partial but, one hopes, evolving comprehension. Whatever adaptive comprehension eventually is achieved doubtless will be embedded in many unresolved arguments and probably will be obscured by sustained misconceptions that only come to be recognized with the advantage of very distant retrospect. It is too early to project ultimate outcomes with any confidence, but it is possible to identify some of the major security problems that will drive the process of adjustment and some of the basic principles that are likely to shape it. The central purpose of the chapters that follow is to identify formative problems and organizing principles relating to the predictable issues of security. They examine in sequence how the configuration of nuclear and conventional forces might be affected, how the problems of communal violence and the dangers of technical proliferation might be managed, and how security relationships among the major states might be altered. Many other issues might arise, but one can be reasonably sure that the state of international security in the globalizing environment will be determined in large part by how these issues evolve. This discussion aspires simply to stimulate productive thinking, as distinct from attempting to reach settled conclusions. As Søren Kierkegaard once observed, life is understood backward but lived forward. Thinking forward under uncharted circumstances is risky, confusing, and contentious but must nonetheless be attempted.