



Center for International and Security Studies at Maryland

Prospects for Security Transformation

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Introduction

Certainly for many decades and arguably for most of history, security policy has been an overriding priority of major governments, and large scale forms of deliberate aggression have been the dominant concern. In response to that concern large investments have been made to create military forces prepared for immediate use, and the resulting balance of national military capability has generally been considered the principal determinant of international order. Over the past decade, however, that traditional conception has been continuously eroded by circumstances that do not readily fit the presumptions. The idea of belligerent opponents has been preserved, but the list of candidates has receded to a small number, none of whom are plausibly capable of the classic forms of massive aggression. The extensive violence that does continue to occur is episodic, small in scale, and widely dispersed. In the United States at least, the phenomenon of terrorism has been depicted as a global enemy, but the damage directly caused by terrorist actions has so far been a small fraction of that resulting from civil conflicts and ordinary crime. The capacities and characteristics of the largely anonymous perpetrators seem to be less relevant than the underlying causes. At the leading edge of practice, security officials are being driven to contend as much or more with dangerous processes as they are with deliberate opponents, although the distinction has yet to crystallize in the formulation of policy.

It is, of course, notoriously difficult to appreciate a fundamental shift in historical circumstance if you are caught in the middle of it, but there are some very strong indications that a major redirection is occurring, having to do with the aggregate pattern of human development. With economic growth in recent decades concentrated among the wealthier segments of all societies and population growth concentrated in the poorer segments, the global distribution of resources appears to be too inequitable to be indefinitely sustained without generating potentially unmanageable amounts of civil violence. Although the connection between violence and economic performance is neither simple nor well understood, it is prudent, even mandatory, to assume that accumulating grievance combined with increasing access to information and destructive technology poses a major threat to the preservation of consensual order necessary to operate the global economy and to manage the interactions it generates. Not even the most advanced military establishments could expect to cope with a general breakdown of legal order. They could not deny access to any major society by people determined to wreak havoc and they certainly could not identify and preemptively destroy all those who might wish to do harm if their numbers were large. Assuring at least minimally equitable global standards of living and achieving the political accommodation necessary to support that objective is the foundation of security. No amount of traditional military capability could compensate for the failure to establish those determining conditions.

There are some very demanding requirements that derive from that presumption. Whatever else might be involved, raising the standard of living of the poor to an acceptably equitable level can be expected to require expansion of the global economy by a factor of five over the next fifty years, a doubling of food production, and something like a tripling of energy production even if efficiency gains are dramatic. In order to do all that within the limits of atmospheric tolerance, human-induced carbon gas emissions will have to be sharply restricted, and the technical basis for energy supply and consumption will have to be dramatically altered — from approximately 20% non-fossil fuel at the moment to better than 80% by 2050. In order to accomplish that transformation on the schedule required against at least the initial resistance of current energy markets, extensive public investments

would have to be made on a global scale and extensive transfers of technology would have to occur to China and India especially. With nearly 40% of the total human population between them and extensive internal economic development beginning to occur, these two countries are inevitably the core of the global warming problem, but they cannot reasonably be expected to meet the investment requirements with their own resources alone. Current security relationships are not compatible with the investment process required; but, if it does not occur, the destructive effects of altered climate patterns threaten to rival or surpass anything that human warfare might do.

So far, however, those evident developments -- compelling as they appear to be -- have not commanded official attention, especially not in the United States. In fact the security policies of the Bush administration very assertively defy the implications. In a commencement speech at West Point in June of 2002 and in two formal documents issued subsequently, the president radically revised longstanding United States policy, but he did so not to address the fundamental circumstances of globalization but to change the rules for dealing with traditional threats. Most notably he asserted the right and declared the intention to initiate the use of force, including nuclear weapons if necessary, to prevent the acquisition of mass destruction technology by “rogue” states judged to be inherently belligerent.¹ Those pronouncements were presented as a deliberate revision of established security doctrine and were received as apparent repudiation of prominent international commitments.² The general understanding has long been that the legitimate use of military force, and of nuclear weapons in particular, would be restricted to the prevention of imminent attack — a formulation that allows for deterrent retaliation and defensive reaction but that does not extend to denying a potential adversary the right to possess weapons. With the invasion of Iraq in March of 2003, the asserted doctrine acquired a degree of significance that could not have been achieved by declaration alone. In retrospect it is now apparent that Iraq may have harbored an aspiration to acquire weapons of mass destruction but did not actually possess them, did not have active efforts to acquire them, and did not pose an immediate threat of use. Initiating attack in this situation poses obvious questions as to how broadly that principle of preventive coercion might be applied and what the extended consequences might be.

There are peculiar features of the Iraq situation that serve to limit the precedent. As a result of UN Security Council Resolution 687 generated by its assault on Kuwait in 1990, Iraq became the only country in the world formally denied the right to possess nuclear, chemical, or biological weapons and associated delivery vehicles.³ Its embargoed economy and its general defiance of international standards under the rule of Saddam Hussein rendered it perhaps the least capable and most isolated of the alleged rogue states. If Iraq were to be its only application, the Bush doctrine could be considered a qualification rather than a fundamental revision of the established international security regime.

¹ Remarks by the President at 2002 Graduation Exercise of the United States Military Academy West Point, New York (June 1, 2002). Available at: <http://www.whitehouse.gov/news/releases/2002/06/20020601-3.html>; [The National Security Strategy of the United States of America \(September 2002\)](#). Available at: <http://www.whitehouse.gov/nsc/nss.html>; and National Strategy to Combat Weapons of Mass Destruction (December 2002). Available at: <http://www.whitehouse.gov/news/releases/2002/12/WMDStrategy.pdf>

² New Agenda Coalition Working Paper, Submitted by New Zealand on behalf of Brazil, Egypt, Ireland, Mexico, South Africa and Sweden as members of the New Agenda Coalition (NAC), NPT/CONF.2005/PC.II/15 (April 29, 2003). Available at: <http://www.acronym.org.uk/npt/03doc16.htm>

³ United Nations Security Council Resolution 687 (April 3, 1991) is available at: <http://ods-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/596/23/IMG/NR059623.pdf?OpenElement>

It is evident, however, that the United States is entertaining expansive aspirations that could in principle give the doctrinal revision revolutionary implications. The level of military investment it is sustaining and the capability it is acquiring go well beyond what traditional planning standards would require — the ability to defend the United States and its formal allies against traditional contingencies of potential aggression by designated opponents at specified locations.⁴ While conceding that no other country is undertaking military preparations that present a major immediate threat to these core objectives, the United States is developing advanced military capabilities, using inherent feasibility rather than estimated threat as the planning standard. The advertised purpose is to be able to conduct continuous surveillance and perform high-resolution observation in any part of the world, and to initiate precise attack in rapid reaction to any threat or opportunity it observes. It would deny comparable capability to all other military establishments and thereby establish decisive superiority across the entire array of potential missions. Were those aspirations to be achieved, the United States would be capable not only of disabling any other country's military forces but also of conducting highly coercive operations against any other society. This combination of evolving capability and declared intent represents an apparent policy of military domination that has already provoked strong reactions from the rest of the world.

International concerns about the Bush administration's military ambitions have been compounded by its accompanying assault on the pillars of international legal regulation and on the political sensitivities of traditional allies. In June 2002 the United States formally gave notice of withdrawal from the 1972 ABM treaty, thereby dismantling the centerpiece of bilateral restrictions on strategic nuclear force deployments that it had negotiated with the Soviet Union and reaffirmed with the Russian Federation. The replacement arrangement — the 2002 Moscow Treaty — preserves the formal principle of legal restraint in offensive deployments, but does not prevent the United States from acquiring a progressively improving potential for disabling the Russian deterrent force. Russian military planners can still plausibly expect to fend off a decisively disarming strike, but in physical and operational terms the main source of bilateral reassurance is now more rhetorical than real, and the basis for internal confidence is relentlessly diminishing. China, as an indirect beneficiary of the bilateral arrangements, has a yet more acute version of the same problem. In less dramatic but nonetheless politically significant actions, the United States has virtually repudiated the Comprehensive Test Ban Treaty (CTBT) and assertively terminated negotiations for a verification and enforcement protocol for the Biological Weapons and Toxins Convention (BWC). Since the CTBT has long been the single most prominent condition for general adherence to the Nonproliferation Treaty (NPT), its repudiation signals an unmistakable disregard for the NPT regime. The Bush administration's non-proliferation plan would replace the basic bargain between NPT nuclear-weapon and non-nuclear weapons states parties with more forceful efforts to prevent the spread of enrichment and reprocessing technology to any additional countries even for purely peaceful programs⁵. The invasion of Iraq was undertaken in defiance of especially strong objections from France and Germany and despite failure to pass an authorizing resolution in the UN Security

⁴ Since the type of capability the United States is developing is designed for large scale operations, it cannot be explained in the assessment of other countries as a rational response to an emerging threat of terrorism. As demonstrated in Iraq and in many other previous examples, the decisive defeat of a military establishment does not confer the ability to stop terrorism emanating from a society that supports it.

⁵ Remarks by President Bush on Weapons of Mass Destruction Proliferation, National Defense University, February 11, 2004, available at <http://www.whitehouse.gov/news/releases/2004/02/20040211-4.html>, accessed on March 4, 2004.

Council. To an extent that is not well appreciated in the United States, the rest of the world is drawing the conclusion that the United States now rejects the provisions of legal restraint and political accommodation it once actively sponsored and does not intend either to rely on them or to be bound by them.

All this poses a serious planning problem for security bureaucracies throughout the world. The apparent contempt for international legal restraint is a radical departure from American tradition which has long proclaimed the rule of law, both at home and abroad, to be the foundation of democracy and security. Foreign planners can reasonably doubt that the American political system will actually abandon its tradition to the extent currently being implied, but they will also have to recognize that for some indefinite period of time the United States government is not likely to be the architect and champion of international legal restraint that it has been for the past half century. They can also plausibly doubt that the military program being projected in the United States will actually be sustained at the level required to establish the decisive superiority being imagined. The details of investment and of technical accomplishment do not yet match the flamboyant aspirations advanced in military planning documents. They can also question how long domestic political support for current U.S. security policies can be sustained. American public opinion has so far tolerated the doctrine of preventive coercion and its specific application in Iraq, albeit with growing unease. But American public opinion does not appear inclined to endorse the idea of imperial domination, let alone the expansive investment of resources that would be required.⁶ It is clear, however, that the American political system is still operating under the acute sense of threat generated by the September 11 terrorist attacks and that security policy is controlled by a radical minority intensely dedicated to the asserted doctrine and its supportive military program. No prudent planner can simply assume that economic, technical, or political constraints will prevent the United States from amassing coercive capabilities that might be used to impose its own national political will. Everyone affected — traditional friends as well as potential enemies — has strong reason to contemplate how they will react if the projected American security policy is pursued beyond what may be reasonably tolerated.

There are at least three basic options that presumably will be considered. First, in principle other countries could attempt to match the American military program. That will be a prominent instinct within those military establishments that aspire to achieve the highest standards of performance, but the effort required does not appear either feasible or sensible for any other society. The scope and momentum of investment that the United States has established over several decades is too extensive and has too many dimensions to be duplicated rapidly. Any dedicated effort to do so would further stimulate the American effort and might enable it to command the additional resources required to pursue more seriously the vision of dominance. Such an effort would also divert investment from more compelling priorities of economic performance. Second, a threatened competitor might seek to negate the instruments of dominance rather than to replicate them. That is technically and economically more feasible and might ultimately be considered necessary. In particular it might be done by denying U.S. access to the space assets required to engage in advanced forms of military coercion. Overt development of that strategy would also lock in a pattern of confrontation that would stimulate the American program, however, and it is difficult to be confident the techniques of negation would reliably prevail at an acceptable cost in an extended competition.

⁶ Steven Kull, "Americans on MD Proliferation," CISSM/PIPA/Knowledge Networks Poll (April 15, 2004), available at: www.ciissm.umd.edu/documents/PIPAWMD.pdf.

Third, a constructive strategy might attempt to develop common interest to the point that it could contain and eventually replace the impulse for dominance. That strategy is imaginable in principle, highly desirable, and not without precedent — witness the transformation of European security relationships over the fifty years following the second world war. It requires a great deal of wisdom and courage, however, for any society to pit higher forms of statesmanship against raw power. None of the basic choices — replication, negation, or transformation — can easily emerge as the dominant international reaction.

The situation presents a significant problem for the American political system as well. The doctrine of preventive coercion with its implication of imperial dominance is largely the project of an intense political minority. Although the policy of domination has evident resonance with some official military planning documents, the hard-edged assertion of intent has not emerged from professional military channels and certainly not from majority political opinion. The shock of the September 11th terrorist attack and the exigencies of the Bush administration's open-ended war on terrorism have been used to silence criticism of the announced doctrine, its application to the Iraq situation, the denigration of allies, and the repudiation of international legal instruments. For the United States to remain a democracy worthy of the name, fundamental questions must be asked about whether coercive prevention and imperial dominance will bring greater security or growing violence and disastrous political isolation. The single-minded pursuit of national advantage can be expected to generate forms of threat the United States could not defeat. It would assuredly undermine the legitimacy of U.S. military operations throughout the world — a vital if insufficiently acknowledged ingredient of practical capability.

Ironically, however, the provocation and apparent misdirection of American policy creates constructive opportunity. If the circumstances of globalization are indeed as relentless as they appear to be, leadership will predictably gravitate to those who come to understand the implications, and it is very likely that principles of equity and methods of accommodation will prove to be of much greater significance than traditional forms of military confrontation, however they might be enhanced in technical terms. That implies that a constructive response to the provocation emanating from the United States military program is feasible in principle — one that would subordinate the divisive practice of confrontation to inherently more efficient methods of direct collaboration. Collaboration is possible when fundamental interests are aligned and becomes imperative when those interests cannot be reliably protected by coercive means alone. There are compelling circumstances of that sort in the emerging situation — most notably, the control of biotechnology and nuclear explosive material and the management of space activities. There also are specific countries that might have the incentive, capability, and ingenuity to develop strategies of collaboration in response to those circumstances — most immediately, Russia and China, and eventually India as well. The possibilities are certainly worth exploration.

The Provocative Effects of Preventive Coercion

Strategic justifications affect the credibility and legitimacy of a country's security policy in the judgment of its own population, its allies, and the rest of the world. For the moment at least, the rogue state rationale provides a justification for acquiring more advanced military capabilities and removing limitations on how that force might be used that is politically effective within the United

States. That rationale is far less convincing to most of the United States' traditional security partners, however, and it is not remotely credible to those countries outside of the United States alliance system that have reason to contemplate the possibility of military confrontation. In terms of units and equipment, the basic structure of United States forces is some 30 percent below the levels maintained during the latter stages of the Cold War, but the budget is now well above the Cold War average in real terms. The Bush administration's military budget request for 2004 exceeds the combined budgets of the next twenty-five top-ranking military establishments. With extensive investment being effectively directed to the precise delivery of conventional munitions and to the integration of combined arms operations, the combat capacity of the United States military relative to any potential opponent is far in excess of what it ever has been, and the advantage will continue to increase for an indefinite period of time. Defense against the entire list of usual rogue suspects — as distinct from imperial dominance — would not require capabilities of that magnitude, even if they were to coordinate the threat they posed. Attributing a coherent purpose to the United States military effort, therefore, requires a good bit more than the rogue rationale most prominently offered.

To those who follow the internal justification of the United States military program in detail, as potential opponents certainly do, there is ample indication of a more plausible purpose.⁷ Beyond their immediate concern with the alleged rogues, American military planners occasionally speak about the possible emergence of a "peer competitor" — a code word that could only apply to Russia or China if existing alliance arrangements are preserved. The basic notion is that the standard for military competition should be set so high that any self-appointed candidate for peer status will be dissuaded from undertaking the effort. Informed Chinese observers do not hesitate to express their firm conviction that this policy is primarily directed against them. Russian observers are currently more circumspect in what they say but clearly harbor similar apprehension.

The differing degrees of candor from China and Russia reflect their different circumstances and immediate political strategies. China has recently been increasing its military investment from a very low historical base, but its forces could not support direct military confrontation with the United States and are not on a development trajectory that would eventually allow them to do so. China nonetheless recognizes that the active dispute over sovereign jurisdiction in Taiwan might generate such a confrontation under circumstances that China does not initiate and could not control. Russia is struggling to contain a precipitous decline in military investment, but the nuclear deterrent force it inherited from the Soviet Union continues to provide adequate protection and there is no immediate cause for confrontation comparable to the Taiwan situation. Russia has more time and better standing to attempt political accommodation sufficiently robust to deflect military confrontation. If the United States military effort is relentlessly sustained, therefore, China will be forced to carry the burden of direct reaction before Russia or any other country would feel similarly compelled.

There is evident injustice in that fact. Among the five military establishments that have long maintained nuclear weapons and significant conventional forces, China's pattern of deployment and

⁷ Leaked excerpts from the U.S. Nuclear Posture Review (December 2001) assert that a new strategic triad composed of offensive strike capabilities; defenses; and a robust, responsive military infrastructure are needed to dissuade, deter, or defeat a wide range of near or long-term potential adversaries, including China and Russia (available at: www.globalsecurity.org/wmd/library/policy/dod/npr.htm). Influential, but unofficial, papers are sometimes even more explicit that U.S. military capabilities must be designed to handle larger threats than those that might plausibly emanate from so-called rogue states and terrorists, but also from China and Russia. See Keith Payne, "Strategic Offensive Forces and the Nuclear Posture Review's "New Triad," (National Institute for Public Policy, March 2003).

doctrine of use has been by far the most restrained. China is generally credited with having about 20 ballistic missiles that could carry single nuclear weapons over intercontinental ranges. It is estimated to have approximately 100 intermediate range ballistic missiles (1,800 to 5,500 km) that could reach targets within the surrounding region, although many of these missiles are aging and some may not be operational.⁸ These launchers are not maintained on alert status, and it would require several hours of potentially observable activity to prepare them for combat operations. During that time they would be exposed to preemptive attack. Both in terms of its destructive potential and its inherent vulnerability, China's nuclear deterrent force is substantially more limited than the others'. It embodies the prevailing standard of minimum deterrence. The associated declaratory doctrine is correspondingly limited as well. China has stated that it would not initiate the use of nuclear weapons under any circumstance and has explicitly affirmed that it would not use nuclear weapons against any state that did not possess them. That categorical assurance has been explicitly extended to Taiwan, with special emphasis, lest anyone think that rejection of its independent sovereign status would somehow create an exemption.⁹ Moreover, while China is developing solid-fueled mobile missile launchers that would be less susceptible to preemptive attack, it is doing so on an extended schedule that does not as yet indicate a commitment to alter its minimal nuclear deterrent posture. That posture has been preserved long enough to make it clear that it is a deliberate choice rather than an expedient.

China's conventional force development and record of use have been similarly modest. In the half century since the Korean War, China has engaged in border skirmishes with India, Russia, and Vietnam that were significant to those three countries, but it has not generally attempted anything that could be fairly described as power projection within the region, let alone at greater distance. China's conventional forces are large in terms of manpower, but there has been no systematic effort to develop its obvious comparative advantage in available manpower into any extensive capacity to operate beyond its own borders. Instead, China has made a dedicated diplomatic effort to settle border disputes, especially with Russia. Over the past decade, China has been increasing its defense investment, purchasing more advanced equipment, and upgrading the combat readiness of a small portion of its conventional forces. But so far, the improvements do not reflect any serious effort to pursue the power projection aspirations that are often attributed to China by American commentators in particular.¹⁰ The main exception to the modest pattern has been the deployment of some 450 conventionally armed ballistic missiles in range of Taiwan, a capacity that confers bargaining leverage but not the ability to seize the island.

In all, compared with the strategic principles of other major military establishments, China's military posture indicates an underlying security calculus that places greater emphasis on self-

⁸ Robert S. Norris and Hans M. Kristensen, "NRDC Nuclear Notebook: Chinese Nuclear Forces," Bulletin of the Atomic Scientists (November/December 2003), pp. 77-80.

⁹ For example, when asked if China would use nuclear weapons against Taiwan, Chinese Foreign Ministry spokesman Sun Yuxi said "We will not be the first to use nuclear weapons and will not use nuclear weapons against non-nuclear weapons countries and regions, let alone against our Taiwan compatriots," Charles Hutzler, "China vows not to go nuclear in conflict with Taiwan," Associated Press Worldstream (September 02, 1999) np.

¹⁰ In October 2002, Jiang Zemin reportedly offered to remove these missiles from Nanjing Military Region in return for a suspension of arms sales to Taiwan. The United States rejected the deal on the grounds that the missiles could be replaced relatively quickly. See John Pomfret, "China Suggests Missile Buildup Linked to Arms Sales to Taiwan," The Washington Post (December 10, 2002), p. A 01.

restraint, reassurance, and political accommodation than it does on active confrontation. Clearly, Chinese strategic policy might be reoriented in response to provocative American military developments that increase China's vulnerability. If so, a contentious Chinese reaction might conceivably be the catalyst for another direct confrontation with a peer competitor, ultimately entangling Russia and generally fulfilling the prophecies of great power theorists. That expectation reinforces the American effort to preserve its current military advantage, and will assuredly be explored in detail within the United States. The more interesting possibility, however, is that China might develop its traditional policy of restraint into a genuinely consequential strategic advantage and that it might effectively compete more in terms of justification than capability. That thought would be virtually incomprehensible to the advocates of military dominance and to many of those who fear it as well. Nonetheless, as the path that appears destined to be the less examined, it has perhaps the greater claim to attention.

The Choice of Strategic Principle

Despite the revisionist aspirations of the United States, mutual deterrence remains the reigning doctrine and prevailing practice of international security. Although not as frequently or as prominently proclaimed as it once was, the basic idea of preventing deliberate attack by threatening overwhelming retaliation is practiced on a daily basis around the world and around the clock. At every moment there are submarines on deterrent patrol, each one of which is poised to deliver in less than an hour more explosive power than all of the munitions expended during the course of World War II. If the aggregate firepower embedded in all the nuclear arsenals were to be unleashed according to current operational plans, more people would be killed in a fraction of a single day than the 120 million who perished in the hundreds of wars fought during the 20th century — the most destructive on record. That level of violence, both actual and potential, would have been inconceivably appalling to most people in 1900 before those wars occurred, but it had become an accepted commonplace to their descendants a century later. The legitimacy of nuclear deterrence is based on the assumption that a massive threat continuously displayed prevents the larger forms of deliberate aggression from recurring — by dissuading, as distinct from defeating, those who might initiate attack. The risk of a catastrophic accident that is thereby created has been considered justifiable when weighed against the risk of deliberate aggression.

Mutual deterrence is recognized to be a crude, even brutal, arrangement that is highly questionable in moral terms. It is also inequitable in that only a few countries are allowed to wield the threat that supposedly offers general protection. But it is an adaptive reaction to the technical impossibility of monopolizing, defeating, or defending against the full destructive power of nuclear weapons. Over the course of the Cold War, nuclear deterrence was supplemented with more constructive strategies designed to cultivate common interests and shared norms, to demonstrate restraint, to provide reassurance, and to establish legal constraints on nuclear programs. These refinements played an important role in stabilizing deterrence, but they were built on an underlying balance of power. The practice of mutual deterrence is powerfully entrenched in military operations that have evolved over five decades, and it will not be readily uprooted. Deterrent force operations present what is by far the greatest physical threat to all societies and set the basic conditions of security even for the large majority of countries that do not directly participate.

As a practical matter the mutual feature of the global deterrent arrangement is primarily embodied, both historically and currently, in the relationship between the Russian and the United States nuclear forces. Between them they control more than 95% of the total nuclear weapons inventory and maintain the only two fully developed and operationally independent command systems. Although advocates of preventive coercion as the new American doctrine like to claim that mutual deterrence is a relic of Cold War history no longer relevant to the new situation, the enduring fact is that it provides protection against a dangerous concentration of power — the international equivalent of the checks and balances fundamental to the United States constitution. Since the corrupting effects of excessive power must prudently be assumed to be generic — not peculiar to any individual, organization, culture, or historical era — the protective balancing of mass destruction capability is as relevant and vital as it ever was and will remain so as long as that capability is preserved in any form. Now and for the indefinite future the burden of balancing the United States nuclear weapons capability will fall principally on Russia, and it is an imperative general interest, including of the United States itself, that the burden be safely and successfully carried.

For the moment it appears that this unavoidable task can be adequately performed. The Russian force is effectively enough protected against a preemptive attack to deny the United States confidence that such an attempt would be decisive. The relative decline in Russian capability is certainly sufficient, however, to degrade the standards of operational safety to an extent that cannot be effectively measured. Improving capacity for intrusive surveillance and for rapid and precise attack with conventional weapons will give the United States an increasing potential for disrupting Russian command system procedures while conducting an interdiction campaign against the weapons themselves. The limited forms of missile defense that are plausibly achievable could provide useful protection against the small numbers of weapons that might escape a preemptive campaign even though such a missile defense could not handle a fully coordinated retaliation. Under those evolving conditions, the Russian deterrent force operating with very restricted financial resources will predictably be driven to compensate for increasing physical vulnerability by preparing to preempt an American preemption — that is, to initiate retaliation at the earliest stages of any serious engagement. That method preserves the basic deterrent effect under conditions of disproportionate capability, but it makes the necessary business of balancing unnecessarily volatile. Coupled U.S. and Russian forces committed to massive retaliation and rigged for rapid preemption create the potential for inadvertent catastrophe. At some unknown point of uneven capability, moreover, the stronger force might become seriously tempted to eliminate the residual threat of the weaker one, thereby undermining the deterrent effect itself. Both problems are compounded by the fact that current rules of political discourse prevent either of the principal protagonists from openly addressing them.¹¹

For the rest of the world this situation presents major problems of judgment. Can it be safely assumed that the central strategic balance will not deteriorate to the point of catastrophic failure? If not, then what? Can the revisionist aspirations of the United States be contained or reversed? Can

¹¹ Current political discussion of the topic is dominated by projected reductions in the number of deployed nuclear weapons, usually characterized as dramatic, and typically assumes that the real danger has largely been eliminated by a transformation of the political relationship between the United States and Russia. The operational practices and the destructive potential of the deterrent forces are rarely mentioned, and there is no active negotiation that would relieve the pressures being imposed on the Russian force.

Russia be effectively bolstered in its balancing role? Is there a realistic alternative to crude deterrence or coercive dominance?

The burden of making those judgments falls most heavily on China, not only because China is the major power whose security is most immediately and directly affected, but also because China is the most obvious candidate to assume a supplemental or even primary balancing role given its rising global importance in economic and social terms. China's officials have been and will undoubtedly continue to be very circumspect about their thoughts on these questions, but it is important for everyone to consider how the situation might be viewed from their perspective. Unfortunately there is no guarantee that China, or any of the other countries less directly implicated in the history and current practice of mutual deterrence, has been rendered wiser by its relative detachment, but at least they have both the opportunity and the incentive to attempt to be. If it is true, as Jorge Santayana famously asserted, that those who cannot remember history are condemned to repeat it, then it should be at least as true that those who can remember nothing else are also condemned to repeat it.

Admittedly, repetition of the familiar is much easier to imagine than innovation. Outside assessments of China's strategic development have typically assumed that China, by 2015, will have deployed 75 to 100 warheads on intercontinental ballistic missiles primarily against the United States. The majority of these missiles are expected to be solid-fuel, mobile missiles and may be capable of carrying multiple warheads or missile defense countermeasures to intercontinental range. Such a posture would more nearly match the American and Russian pattern of deployment — that is, a larger force continuously available for massive retaliation and less vulnerable to preemption. The testing of mobile, solid-fuel intercontinental missiles does indicate that China is exploring, one might say displaying, the anticipated option. So does a pointed reference to multiple-warhead technology advanced under circumstances of unmistakable political resonance.¹² So far, however, the Chinese planning system does not appear to have authorized the larger scale and operationally more active deployment pattern required by the traditional mutual deterrence doctrine, and it has explicitly articulated some of the basic reasons for reluctance — most notably, expense and provocation.¹³ The question is whether those who determine Chinese security policy have developed, or are developing, an alternative strategic conception that could withstand the pressure imposed by

¹² The Chinese claim that it had mastered the technologies for multiple re-entry vehicles was announced amidst the political furor following (somewhat exaggerated) Congressional accusations that “the United States has been the victim of systematic espionage” that would, among other things, “make it possible for the PRC to develop and deploy missiles with multiple reentry vehicles.” See The Report Of The Select Committee On U.S. National Security And Military/Commercial Concerns With The People's Republic Of China (The Cox Report) House Report 105-851. Available at: <http://www.access.gpo.gov/congress/house/hr105851/>. The Chinese government responded with a lengthy refutation, which stated that China had already mastered “nuclear weapon miniaturization technology” as well as “its dispenser design technique. There is no key technology hard to master,” the response concluded, “for improving China's MIRV technique.” See: Information Office of the State Council, People's Republic of China, Facts Speak Louder Than Words and Lies Will Collapse by Themselves—Further Refutation of the Cox Report (July 15, 1999). Available at: <http://www.china.org.cn/e-fabuhui/download/news/English/PressConferences/990715/990715-2.htm>.

¹³ For example, a reporter asked then-Ambassador for Disarmament Affairs Sha Zukang about Chinese warnings that “an arms race against NMD” could bring “about the collapse and bankruptcy” of China; Sha responded: “We didn't participate, we are not participating, and we will never participate in any arms race.” Sha's remarks (March 23, 2001) are available from the Chinese Foreign Ministry at: <http://www.china-un.ch/eng/9375.html>. Jiang Zemin reiterated essentially the same position, in much less detail, during an interview with The New York Times. See: “In Jiang's Words: ‘I Hope the Western World Can Understand China Better’” The New York Times (August 10, 2001) p.A8.

the surge of United States capabilities and the deterioration of Russia's. If so, might the standard expectation be confounded?¹⁴

A direct authoritative answer to that question would require more access to the inner deliberations of Chinese officials than anyone outside its leadership is ever likely to have. It is inherently unlikely, moreover, that an alternative strategic doctrine could yet have acquired either the definition or the institutionalized adherence conferred by the long evolution of mutual deterrence. Nonetheless, there are meaningful indications of alternative thinking not only in the notable pattern of restraint that China has imposed on its overall security posture but also in the underlying principles of policy reflected. It is useful to consider the inferences that can plausibly be drawn.

The primary implication is that China has genuinely discounted the practical significance of mass destruction threats on grounds that such threats are so vastly disproportionate to any purpose other than core deterrence as to be ineffective. If that is the judgment, then it makes eminent sense for China to hold its own deterrent threat at a subliminal level and to promote the nuclear no-first-use principle. Any more expansive deployment or doctrine of use would provoke the United States and possibly other countries such as India as well, with no practical benefit to China. An important corollary would be that China has also discounted the possibility of mass invasion, counting on the natural resistance of its large population more than the capacity of its conventional forces to deter or defeat any such venture.

Those apparent judgments implicitly give greater weight to justifying principles in China's overall calculus of security than current United States policy does, and that could well prove to be a superior insight. As the United States is learning in the aftermath of its assault on Iraq, there is an important difference between winning immediate battles and prevailing in the extended consequences that follow. As far as extended consequences are concerned, no amount of destructive power can compensate for policies whose strategic justifications fail to win domestic endorsement, allied support, and principled acceptance by the rest of the relevant international community. In a direct contest between intimidation and constructive appeal, superior justification can reasonably be expected to prevail over the longer term, and China can evoke strong lessons to that effect from its own lengthy political history.

The vital importance and comparative advantage of constructive justification have to do with the dynamics of social consensus. Methods of intimidation will work if they generate sustained acquiescence in the societies subjected to the threats or physical acts of destruction. They become ruinously inefficient, however, if they inspire endemic resistance, as tends to occur if intimidation is utilized as the primary basis for control, not just episodically but continuously over time. As occasional instances of sudden and spectacular political transformation have indicated — Iran in 1979, East Germany and South Africa in 1989, for example — no amount of coercive power can compensate for the decisive loss of domestic legitimacy. The entire process of decolonization in the aftermath of World War II illustrates the same dynamic on an international level.

¹⁴ This question is explored in detail in Jeffrey Lewis, "An Agenda for Sino-American Strategic Dialogue," Ph.D. dissertation, University of Maryland, forthcoming.

It is often supposed that China, with a relatively authoritarian form of government and a contentious human rights record, is neither attentive to the constructive determinants of legitimacy nor skilled in developing them. A credible case can be made, however, that Chinese leaders are acutely sensitive to the topic as it applies within their own political system and to the outside world and that constructive principles are primary instruments of Chinese policy. Acute sensitivity to the importance of principled justification is amply displayed in China's policy toward Taiwan, for example. China has defended its sovereign claim with such tenacity and contested any implication of Taiwan's independence in such exhaustive detail as to leave no doubt about the priority that China places on the topic. The unusual intensity of its commitment is not readily explained by history, current circumstance, or economic interest. It is more readily understood as a reflection of China's conviction that principles of justification and the social consensus that rests upon them provide the foundation for political rule.

Appreciation of constructive principles is similarly displayed in official statements of Chinese policy and perhaps more convincingly in recent trends in Chinese diplomacy. Over the past fifteen years there has been a dramatic surge in China's formal adherence to international treaties and a notable increase in its participation in regional dialogues of the sort it formerly shunned. In the array of declarations and activities involved, China has consistently espoused principles of accommodation and, apart from the Taiwan situation, has consistently opposed the use of threats or the application of force as an instrument of policy. Although expressions of constructive intent are usually discounted as questionably sincere or readily reversed, when combined with the pattern of restraint in military deployment and in diplomatic behavior, as they have been in China's case, they deserve to be taken more seriously.

By virtue of its apparent inclination, then, as well as its strategic situation, China is the country best positioned to contest the most vulnerable aspect of the American military program — the terms of justification. To do so effectively, China would not only have to sustain restraint under the pressure of increasingly intrusive U.S. preemptive capacity but would also have to become a leading proponent of constructive strategic principles that could gain widespread international assent.¹⁵ Other countries might eventually align with China in such a contest on behalf of the international community as a whole, but not on behalf of China exclusively. That process of generalization is conceptually and politically quite demanding. It requires subordinating the prevailing practice of deterrence and the emerging temptation of preventive coercion to behavioral rules and operational practices designed to convey credible reassurance for mutual protection. That in turn requires the subordination of sovereign prerogative and the systematic exchange of highly sensitive information, innovations that China will predictably have difficulty absorbing, let alone promoting, even though precedents can readily be found in contemporary European security arrangements.

It appears unlikely that China or any other country could stage a conceptual revolution that would suddenly and comprehensively transform international security practices. Mutual deterrence itself is more an evolved rationalization of nuclear weapons deployments than a conceptual initiative that originally inspired them. But it is significantly more likely that conceptual innovations might

¹⁵ See, for example, China's Position Paper on the New Security Concept (July 31, 2002). Available at: <http://www.china-un.ch/eng/33227.html>.

have substantial effect in the context of specific issues that by their intrinsic nature serve to force constructive collaboration. As noted, the regulation of biotechnology and the management of nuclear explosive material both have that potential, particularly in interaction with the surge of concern in the United States over the threat of terrorism. Moreover there is a looming collision of policy regarding space activities that offers potentially powerful leverage for China's constructive inclinations. All three issues operating together create the potential for a transforming trend starkly different from the one being advertised by the United States Department of Defense.

Implications of Terrorism

The American reaction to the September 11 terrorist attacks provides potentially significant resonance for constructive transformation, even as it has enabled the provocative doctrine of preventive coercion to be advanced. The events of that day crystallized a new sense of threat with at least two prominent implications. First, the attacks demonstrated that the United States political system can be provoked into self-destructive reactions — actions that undermine internal consensus and external legitimacy. The magnitude and endurance of that effect has not yet been fully revealed, but it is already significant enough to incite emulation from those who harbor massive grievance against industrial societies. Accordingly it has given all industrial societies a common interest in more effective protection. In addition, the attacks implied the potential for terrorist use of mass destruction technology, a possibility that has always been acknowledged but not previously considered significant enough to affect the practice of mutual deterrence. The partially demonstrated effect and the implied one have very different implications, but they can be expected to have a combined consequence of major significance. Basically massive deterrence is not only useless against clandestine terrorist threats but directly perverse. It fuels both the incentive and the technical potential for engaging in terrorist actions while it interferes with the forms of collaboration that might offer meaningful protection. Preventive attack on terrorist organizations appears in principle to be more applicable, but it depends on timely detection of small-scale activities that are readily concealed. A unilateral campaign by the United States to eradicate terrorist organizations by means of preventive attack would seriously, and probably fatally, interfere with the intimate collaboration required for timely detection.

In most historical instances of terrorism, violence has typically been a bargaining tactic used to adjust what the perpetrators consider to be disadvantageous terms of trade. That is a familiar and unfortunately probably an enduring phenomenon. Any instance of such terrorism might capture immediate attention but would not affect fundamental policy unless acts of targeted political violence become much more frequent. In a few terrorist campaigns such as Algeria in the 1950s the imputed purpose is not to advance a specific political bargain but rather to inflict strategic damage on a superior opponent by provoking dysfunctional reactions — the political equivalent of an autoimmune disease. Those instances are inherently more threatening because they have a more broadly hostile purpose, but the victim can control the outcome if it can control its own reactions. As the unfolding consequences of September 11 are demonstrating, that is not a trivial requirement, but no society is likely to see its own susceptibility to provocation as a fundamental strategic threat. A viable democracy provoked into excessive reaction can moderate the dysfunctional effects over time by exercising its normal political processes. For terrorism to present a threat of global strategic significance — not merely in transient perception but in enduring reality — a clandestine

organization would have to inflict sufficient damage to have strategic effect regardless of the reaction provoked. Although there has never been any actual or seriously attempted instance in which mass destruction technology has been used with catastrophic effect, the potential is substantial, and the strategic concern is coherent enough to have a major effect on international security practices.

Both in official policy and in public discussion up to this point, the phrase “weapons of mass destruction” has been categorically applied to any technology that for a given weight or volume is capable of inflicting more damage than conventional explosives. The array most frequently mentioned includes nuclear explosives, chemical agents, toxins, biological pathogens, and radioactive material that might be dispersed by conventional explosives. Usually no distinctions are made regarding the magnitude of risk these various materials pose, but in fact it varies substantially. A crude clandestine assault with chemical agents or toxins might kill thousands of people, a very sophisticated one perhaps millions. A clandestine radiological attack might force the prolonged evacuation or even abandonment of valuable property, but would kill very few, if any, people. In a typical urban area, a single nuclear weapon comparable to the one used against Hiroshima could kill more than one hundred thousand people, while a one megaton thermonuclear weapon could kill millions.¹⁶ It has been estimated that a well designed but technically plausible release of anthrax spores in the Washington, DC, area that remained undetected until the first cases of disease appeared might kill a million people. A contagious pathogen like smallpox, especially one that had been deliberately manipulated for increased lethality, might put tens of millions or even hundreds of millions of people at risk around the world.

Any penetrating consideration of the risks of terrorism will have to acknowledge the importance of these variations. Strategic terrorists counting primarily on the consequences of provocation — the autoimmune effect — would presumably utilize the most accessible of the commonly listed mass destruction technologies on the assumption that any of them would reliably produce a political sensation reinforced by the habitual categorization. To use one would effectively threaten to use them all. The events of September 11 demonstrated that strategic terrorists with significant operational capability do exist, and there is compelling reason to worry about their access to any of the technologies categorized as mass destruction agents. As September 11 also demonstrated, however, mass sensation can be created with box cutters and airplanes, and efforts to block all of the imaginable possibilities would almost certainly compound the autoimmune effect. It is reasonable to anticipate that when the dynamics of this situation are better appreciated than they currently are defense against strategic terrorism is likely to depend far more on identifying the specific individuals and organizations who pose the threat than on denying access more generally to the means for carrying it out.

The possibility of catastrophic terrorism poses a substantially different problem. The term can be applied to acts of direct destruction intended to rival or exceed the consequences of provocation that terrorists themselves cannot directly control. That would certainly be strategic but in a meaningfully different sense. It is speculative at this point whether individuals and organizations

¹⁶ The Hiroshima comparison was leaked from a National Security Council document. See: Massimo Calabresi, "Can we stop the next attack?" *Time* 159:10 (March 11, 2002) p. 24. The thermonuclear estimate comes from U.S. Congress, Office of Technology Assessment, Proliferation of Weapons of Mass Destruction: Assessing the Risks OTA-ISC-559 (Washington, DC: U.S. Government Printing Office, August 1993), p. 53.

capable of wanton destruction on massive scale actually exist, but it is difficult in the aftermath of September 11 to deny the possibility with confidence. If they do exist or come to exist, they would be driven by their imputed objective to attempt either simultaneous nuclear explosions in a number of critical urban areas or the simultaneous release at multiple points — probably airports — of a highly destructive pathogen. These are the only two basic methods currently available whereby a relatively small, clandestine organization could directly generate a truly monumental social catastrophe.

In the normal workings of nature, fortunately, catastrophic events are infrequent, and hence improbable at any particular time and place. In the workings of antagonistic strategic interactions, however, one has to consider that large catastrophes might become more probable because their magnitude makes them an especially attractive choice. Once that thought is examined in detail and in context, as it eventually will have to be, much more extensive efforts to manage the two technologies that most compellingly deserve the mass destruction designation can be anticipated. And the level of international collaboration required for those efforts to succeed is not likely to be compatible with the doctrine of preventive coercion that the United States has recently advanced.

Management of Potentially Catastrophic Technology

Although sharing catastrophic potential and therefore presenting a common managerial problem, nuclear explosives and biological pathogens have starkly different characteristics and different historical legacies. So far it has required large industrial facilities to extract or create the radioactive isotopes that can sustain a nuclear explosion. Access to those facilities and their products has been actively controlled from the outset, and fabricated nuclear weapons have long been the most elaborately protected of all human commodities. The prevailing arrangements are not impenetrable, especially not within the extensive network of facilities that Russia inherited from the Soviet Union. Higher standards of protection are currently being pursued and significantly higher ones are feasible. Nonetheless the physical and procedural barriers to any unauthorized use of nuclear explosives currently define the most advanced standard of active control.

In contrast, biological pathogens are spontaneously generated in nature, and in physical terms at least, the process of extracting and producing them is not remotely as demanding as it is with nuclear explosives. The facilities required are not large or distinctive, and access is not as carefully restricted. Until very recently biological pathogens were freely exchanged for purposes of scientific exploration, epidemiological investigation, and medical diagnosis even between otherwise antagonistic societies. Scientific understanding of these pathogens emerges from a globally dispersed biomedical research community whose activities are conducted for compellingly legitimate reasons. In that context it has been neither practical nor appropriate to sequester information or materials to the extent that it has been done for nuclear explosives. The barriers to hostile use of biotechnology have been primarily attitudinal in character, a form of passive control more significant than is commonly appreciated but clearly not comparable to the physical and procedural barriers surrounding nuclear explosives.

In general the destructive application of nuclear technology has been legitimized by the practice of mutual deterrence but elaborately restricted. Offensive application of biotechnology is the

least legitimate and historically least developed of the mass destruction technologies but access to the technology itself is not as restricted. Somehow out of these nearly antipodal situations a coherent policy of managerial control over the two catastrophic technologies will have to be fashioned.

The thought naturally arises that the active methods of control devised for nuclear explosives might simply be extended to dangerous areas of biotechnology. Not surprisingly that has been the prevailing reaction in the United States to the anthrax letters that were mailed to politicians and media figures shortly after the September 11 terrorist attacks. Under legislation passed in response to those incidents, all stocks of live agents and toxins agents deemed to be dangerous must be registered with the federal government, and access to the listed agents must be restricted to persons who have cleared background checks. National identity is henceforth to be used as a criterion for access. In addition several billion dollars have been allocated to initiate protective research efforts, a significant portion of which is to be directed to “threat assessment.” The term refers to exploration of destructive applications of biotechnology to determine in detail the threats that might emerge. Work of that sort is to be subject to security classification in order to prevent potential terrorists from learning about it.

Natural and perhaps inevitable as those measures may be, however, the attempt to impose traditional national security controls on biotechnology is virtually certain to be ineffective and is very likely to have overwhelmingly perverse consequences. Research in critical areas of molecular biology is globally distributed and openly conducted for unquestionably compelling reasons. The investigation of basic life processes that has been gathering momentum for several decades is now delivering results of enormous consequence for public health and medical therapy. With improved understanding of the dynamics of life at the molecular level, the eradication or mitigation of many historical diseases will be possible. The enhancement of basic cognitive, emotional, and reproductive functions will probably also become possible. Great scientific achievements are in prospect and vast fortunes are to be made. No national security bureaucracy citing the uncertain threat of catastrophic terrorism will be able to justify the imposition of secretive authority over this momentous, inherently open process. The attempt to do so will predictably incite resentment, suspicion, evasion, and emulation. Threat assessment as currently being practiced is more plausibly a self-defeating method of threat stimulation than a responsible means of protection.

All societies caught up in the momentum of discovery — in effect the entire human species — will have to contend in some manner with embedded dangers that are associated with it. These dangers can arise as easily from inadvertence as they can from deliberate manipulation, so any system to prevent the misuse of biotechnology must not focus solely on potential terrorists, but should also include legitimate researchers whose work could have unintended social consequences. Exactly the same basic research that identifies opportunity for constructive intervention in basic life processes also identifies destructive opportunity as well. Detailed understanding of life processes enables beneficial and malign applications, and unfortunately there are reasons to believe that it is easier to produce a single destructive effect than it is to defend against all possibilities. Infectious diseases significantly more lethal than those that have naturally evolved could in principal be created — a supposition widely thought to be impossible as little as a decade ago. Nefarious manipulations of thoughts, feelings, and reproductive capability are much more speculative at this point but appear to be a serious possibility. The scope of application of biotechnology is so broad and the potential consequence so large that innovative methods of protective management responsive to its distinctive

characteristics will almost certainly have to be devised. Over the longer term, one can reasonably surmise, the speculative problem of catastrophic terrorism is likely to be assimilated to the much larger and more immediately pressing problem of managing biotechnology generally.

Although many of the anticipated consequences of biotechnology have yet to be realized, at least three determining features of the situation are readily discerned. First, since the relevant research process is highly developed and globally distributed, managerial oversight will have to be global in scope in order to be effective. That means it will have to be universally accepted as reasonable and equitable. National control and preferential national development of biotechnology is not likely to be feasible for any meaningful period of time regardless of the amount of political will that might be applied to such an effort. Second, since no categorical distinctions can be made at the level of fundamental research between lines of inquiry that are protective and those that are threatening, prudential judgments will have to be made in detailed context by intimately informed scientists, not by government bureaucrats or distant regulators of any sort. But, third, since the potential consequences of molecular biology extend far beyond what even the leading research scientists can be expected to comprehend and since inadvertently destructive consequences must be presumed to be at least as worrisome as deliberately destructive ones, protective oversight must involve representative social as well as scientific judgment and must be appropriately comprehensive. If there is no categorical distinction in biotechnology between beneficial and destructive knowledge, there is no categorical distinction between wise and foolish or good and evil people either. Taken together these circumstances imply a managerial process that is based on principles of independent peer review that are universally accepted in the scientific community, but such a process would have to be broader in scope and jurisdiction, more actively organized, and more refined in legal terms than any of the precedents that might be cited. And arguably it would have to operate at an overall level of fidelity well beyond any that has yet been demonstrated by any regulatory process.

Obviously, the development of a global oversight arrangement that meets these conditions will face a multitude of practical difficulties, many of which will be cited by skeptics as grounds for summary rejection of the entire idea. At the moment there does not appear to be any official consideration of such an arrangement, and recent rejection by the United States of the effort to negotiate a verification and enforcement protocol for the BWC has demoralized the diplomatic community that would have to support active consideration. The underlying problem will predictably be relentless, however, and will presumably compel broader recognition that an emerging technology of monumental consequence cannot be managed as loosely as it has been, especially given a background of intense political grievance. Indeed, a special committee of the National Academy of Sciences recently concluded that the potential for catastrophic misuse of biotechnology research was grave enough to warrant an expanded, strengthened, and more integrated national oversight system — and that over time, such a system must be adopted internationally to be effective.¹⁷ It is reasonable to expect that governments will ultimately be driven to examine global protective oversight procedures for biotechnology and in the course of doing so will be induced to contend with the implications for security practices generally.

¹⁷ Committee on Research Standards and Practices to Prevent the Destructive Application of Biotechnology, “Biotechnology Research in the Age of Terrorism: Confronting the Dual Use Dilemma,” (Washington, D.C.: National Academies Press, 2003).

Some of the more important implications arise from inherent tensions between individually important strategic objectives. The problem presented by emerging biotechnology is that of preventing applications that might conceivably put the entire human species at risk while simultaneously promoting vital benefits for the same clientele. Because the principal source of threat is either inadvertent or clandestine, the entire apparatus of confrontational deterrence as historically practiced is essentially inapplicable. Defensive reaction — all that is involved in diagnosing, treating, and containing a disease outbreak — is feasible enough to be an urgent interest actively pursued, but not reliable enough against the more extreme forms of imaginable danger to be the exclusive or even the primary basis for protection. It appears therefore that preventing the inadvertent or deliberate creation of a catastrophically destructive pathogen must become the predominant concern, and arguably has already become as vital an interest as there ever has been. Significant tension arises because the scientific inquiry necessary to support defensive measures against known infectious diseases will also provide the basis for generating yet more lethal variations. The human species as a whole and all of its constituent societies are apparently compelled to impose systematic restrictions on offensive applications of biotechnology, likely to be easier, while actively pursuing defensive applications, likely to be more difficult — a reverse of the strategic formula long associated with the prevailing practice of mutual deterrence. That reversal of strategic principle would have to be accomplished, moreover, not only in interaction among separately organized societies but also in increasingly consequential interaction with the natural process of evolution, a process which presumably neither guarantees nor precludes the survival of the human species.

Contemporary disciples of Santayana who are more familiar with the history of war than they are with the history of public health are likely to conclude that the offensive application will eventually predominate for biotechnology as it did for the technology of nuclear explosives. That cannot responsibly be considered an inevitable outcome, however. Not only are the incentives and the circumstances substantially different but so also are the available methods. There is important advantage in the fact that the remarkable momentum of molecular biology has been established on the basis of a predominantly open process. Systematic transparency has allowed a collective process of scientific discovery to develop that is far more powerful than one segmented and sequestered by security classification would be, and the same technique offers far more powerful regulation as well. Human societies spontaneously generate standards of behavior that are both equitable and protective, and can enforce them very effectively if relevant information is readily available. Criminals must hide in order to succeed, as must anyone violating strongly established social norms. The norms against destructive application of biotechnology that prevail in the global biomedical community are in fact among the most powerful of all social standards. They prevail across national and cultural differences, essentially without exception. A regulatory system that reinforced the deeply ingrained abhorrence of infectious disease with disclosure rules and the active practice of oversight would be powerfully consequential, so much so that the practical impediments to such a system have more to do with fears of misuse than fears of ineffectiveness. In principle the actively organized practice of transparency and independent scrutiny — the same basic practices that enable financial systems to function despite the eternal temptation to steal — could provide much more advanced protection against the offensive use of biotechnology than currently prevails. Presumably that would forever remain short of absolute assurance, but the degree of protection that could be accomplished is potentially meaningful enough to shape the evolution of international security generally.

It is not difficult to visualize how a protective oversight arrangement would work.¹⁸ The central objective would be that of preventing the deliberate or inadvertent creation of pathogens more lethal than those that have naturally evolved. The basic method of doing so would be a set of procedural rules designed to bring independent, informed scrutiny to bear on all fundamental research activities that have serious possibility of creating catastrophically destructive pathogens. Those activities would be distinguished in terms of the intrinsic transmissibility, infectivity and lethality of the pathogens in question, with great levels of risk associated with higher level oversight and more intense scrutiny. People and facilities engaged in such activity would be licensed according to internationally determined standards. Proposed research would require informed peer review and approval at the local, national, or international level. The conduct of approved projects would be monitored and the dissemination of results would be managed according to internationally agreed rules. Access to especially sensitive information would be restricted to those participating in the oversight arrangements and the fact of access would be documented. Any violation of the licensing and approval requirements or the associated disclosure and information handling rules would be subject to criminal prosecution in any jurisdiction.

If the legitimate scientific community were to engage comprehensively in an oversight arrangement of that sort, there would be direct protection against individual misjudgment and indirect protection against deliberate malfeasance. Any attempt to evade systematic scrutiny would run a substantial risk of detection if comprehensive oversight were the actively practiced standard, and any detected violation would be subject to extremely assertive enforcement. However the practicalities of such an arrangement are judged, the fundamental point is that the degree of protection against the destructive application of biotechnology depends primarily on the degree of global transparency that is achieved. The only way for defenses against infectious disease to outrun offensive misapplication is for the vastly larger numbers of legitimate researchers to combine their efforts through the free flow of information and ideas. Attempts to prevent offensive activities should therefore also be based not on secrecy, but on systematic disclosure of information for mutual protection — a principle that will certainly encounter political resistance but is likely to prove indispensable.

The same principle applies as well to the management of nuclear explosive material, drug trafficking, political corruption, tax evasion, and many other familiar maladies, but it encounters in most of those instances more resistance from the relevant historical legacy. Standards of behavior are generally not as well established as they are with regard to infectious disease, and the right to official secrecy and personal privacy is better established. As a result, behavior that might be judged unacceptably deviant if it were exposed to scrutiny is more readily hidden. It is reasonable to expect, nonetheless, that some significant revision of historical practice might be considered for nuclear explosive materials as the possibility of catastrophic terrorism is taken more seriously. In fact, it seems doubtful that the priority of defense could be established for emerging biotechnology while the priority of offense is sustained in the deployment pattern of nuclear weapons.

In principle, significantly higher standards for the accounting and physical protection of nuclear explosive material could be organized on a global scale while sensitive details about the

¹⁸ For a fuller description, see John Steinbruner, Elisa D. Harris, Nancy Gallagher, and Stacy Gunther, "Controlling Dangerous Pathogens: A Prototype Protective Oversight System," Center for International and Security Studies at Maryland Working Paper, (September 2003), at: <http://www.cissm.umd.edu/documents/pathogensmonograph.pdf>.

design and location of individual weapons are restricted to the states that possess them. Techniques of information management would allow a common accounting system to be established with greater aggregate accuracy than now prevails while controlling access to individual entries with complete assurance. Monitoring techniques could continuously determine the status of control over fabricated nuclear weapons and material containers while obscuring which weapons were stored at which locations in the system, if that latter provision were considered to be a vital national interest. Deterrent capability would hardly be affected, and overall managerial control would be substantially improved. As in the case of biotechnology, albeit to a lesser extent, the degree of protection depends substantially on the degree of transparency that is achieved. Any physical barrier to a nuclear weapon or a cache of nuclear material can be breached if there is sufficient time to do so, but as a practical matter that could not be done if monitoring were active and continuous.

To the extent that the speculative threat of catastrophic terrorism is taken seriously, then, and meaningful protection against it is accepted as a priority security requirement, the major security establishments will be driven to develop protective monitoring techniques to assure managerial control over nuclear explosive material and prudential oversight over critical areas of biological research. Developing such protective regulation would require dramatic revision of the operational principles associated with the prevailing practice of mutual deterrence. Procedures for the organized sharing of detailed information, so as to document continuous compliance with agreed standards of behavior, would necessarily subordinate traditional practices of secrecy to an overriding interest in systematic transparency. Preventive efforts to assure that the potential threat is never realized would necessarily dominate traditional preparations for contingency reaction if it does appear. Security relationships would necessarily elevate interest in protective collaboration over the legacy of confrontation. It remains to be seen, of course, whether the major governments — the United States in particular — are capable of undertaking such adjustments, which could fairly be considered revolutionary in character. It is evident, however, that they are being subjected to potentially compelling incentives to do so. Adaptive reactions might not occur, but they are at least conceivable.

Regulation of Space Activity

Meanwhile, as the possibility of catastrophic terrorism is pondered and the implications assessed, international security arrangements will simultaneously be shaped by an emerging problem of very different character. Sensing and information management technologies are providing the basis for military operations that are extremely precise, rapid and stealthy when judged against historical standards. These technologies are allowing large-scale traditional missions to be performed more efficiently with greater confidence — thereby reducing the self-deterring effect that has historically served to restrain the use of military force. Furthermore, precision technology is enabling extremely intrusive small-scale missions to be undertaken. Since the capability for small-scale coercive intrusion is still not fully developed, there is relatively little precedent to demonstrate how it might be used and what its implications might be, but technical projections are sufficiently robust to energize the imaginations of military planners and the security bureaucracies who do threat assessment. Advanced information technology enables any military organization that masters it — exclusively the United States military at the moment — to undertake coercive actions at long range without warning and possibility even without indisputable attribution. Those actions could be directed, moreover, against critical social assets that normal terrorists could not aspire to reach —

cars or planes transporting the head of state, for example, or a critical power system transformer. Operations of that sort would confer an impressive capability to impose political demands, so much so that the victims would likely consider it an especially noxious form of terrorism. The emerging capability connected to the proclaimed doctrine of preventive coercion is, to put it mildly, an alarming prospect to any country with reason to believe it is a potential target. It would be alarming within the United States as well the moment any other country is judged to have acquired it. When the implications are better appreciated than they yet are, precision strike capability is likely, indeed is virtually certain, to be considered an urgent topic for protective regulation — a central strategic consideration intimately related to all the others.

The capability in question is being generated by such a broad array of specific technologies and practical applications that the focus of effective regulation is a significant question, but it is reasonable to expect that space activities will play a major role. Both currently and prospectively, various support functions performed from space are essential elements of precision strike capability. If the capacity for direct attack in, from, and through space were added, as the United States proposes to do, space would clearly become the primary venue for coercive intrusion and overarching military dominance. Because of the inherent physical and legal vulnerability of space assets, however, it is also the natural venue for countervailing reaction. For these reasons the evolution of space policy is likely to shape the evolution of security relationships generally.

Up to this point, space activities have been regulated by a mixture of formal legal provisions and customary operational practices, most of which were developed primarily to support the mutual deterrence arrangement. Nuclear force operations provided the original impetus for sensing, tracking, optical observation, electronic intercept, navigation, communications relay, and weather assessment. That central purpose dominated the evolution of rules. Scientific exploration and manned space programs introduced competing considerations from the outset, and those have been reinforced in recent decades by commercial utilization. Support for conventional force operations including precision strike capability has also been an increasingly important and somewhat competitive military concern in recent decades. In general, however, the rules have not been adjusted to reflect the changing security context and changing pattern of space utilization. The need to do so has been widely recognized, including in the United Nation's Committee on the Peaceful Uses of Outer Space (COPUS), the U.N. General Assembly, and the Conference on Disarmament (CD) — the U.N.'s independent multilateral arms control negotiation body. In 1994, the CD convened its most recent ad hoc committee on Prevention of an Arms Race in Outer Space. Since then, China has been the most active champion of the effort to secure a negotiating mandate for PAROS, while the United States the principal antagonist. Despite nearly universal international support for an active negotiation, the United States has utilized CD procedural rules to prevent an enabling mandate from being issued.¹⁹

The core issue in contention has to do with weapons in space as distinct from military support activities. The Outer Space Treaty of 1967 (OST) unambiguously prohibits stationing weapons of mass destruction in space and using the Moon and other celestial bodies for non-

¹⁹ In 2003, the annual U.N. General Assembly resolution urging steps to reinforce and expand the legal regime for outer space, including the establishment of an ad hoc Committee on PAROS in the CD, was supported by 174 countries, with no opposition, and abstentions only by the United States, Israel, the Marshall Islands, and Micronesia. In 2002, the New Agenda Coalition Resolution also began to express concerns about space weaponization.

peaceful purposes, including military installations and weapons testing. The transiting through space of such weapons as warheads on a non-orbiting ballistic missile trajectory is not mentioned, nor is any determination made about the utilization of conventional explosives or other technologies not traditionally placed in the mass destruction category. Under China's interpretation the treaty extends legal protection to all other space activities including those providing support for military operations under the provision stated in Article III that such activities are peaceful in character — that is, confined to the right of self-defense conferred by the UN Charter. With that understanding, sovereign jurisdiction exercised over land area, sea approaches, and in the atmosphere cannot be extended into space. Article II declares that outer space is not subject to national appropriation, which means that satellites can orbit over national territory without permission and, by extension, without any legitimate grounds for interference. Under official United States interpretation, a general prohibition on interference with satellites is now firmly established in customary law and thus neither rests solely on the legal foundation of the OST nor is subject to its peaceful-use qualification.²⁰ China maintains that the provisions of the OST must be explicitly extended to prohibit the utilization of weapons of all types in space and suggests, without detailed elaboration, that some constraint on military support activity is necessary as well. China further suggests that the systematic development of space weapons being projected by the United States would violate the terms of the OST and thereby remove the legal protection it provides. The as yet unstated implication is that China and any other country would then be free to interfere with satellite transit over national territory in exercise of its own right of self-defense.

This impasse over PAROS in the Conference on Disarmament can reasonably be seen as an inchoate and slowly developing policy confrontation that ultimately will have ominous implications — the equivalent, perhaps, of a malignant cancer in its earliest stages. Any country that believes itself compelled to defend against coercive threat with a strategy of negation would almost certainly focus on space assets as the most promising opportunity. With some effort, satellites can be observed and, once observed, their movements can be readily predicted. The velocity required to maintain their orbits and the energy required to achieve that velocity makes satellites structurally vulnerable to collision with any object of any appreciable size. In addition, their internal functions are vulnerable to many forms of hostile electromagnetic radiation. It is vastly easier to arrange for direct collisions to occur than it is to avoid them or to protect against the consequences. Electromagnetic interference is somewhat more demanding but still confers an advantage to the attacker. Standard methods of protection can be attempted — hardening, camouflage, evasive maneuver, and active defense — but all of them are substantially more expensive and less effective than they are in other environments. The idea that satellites can be defended with superior technical virtuosity or in wild west gunslinger style might be appealing in Hollywood but not to anyone in the business of operating satellites. The unavoidable fact, largely determined by the laws of physics, is that all space services can be disrupted or denied at a small fraction of the cost required to perform them. Space is an environment so dependent on protective rules that a threat to those rules becomes a threat to the viability of all space activity well before any subtle acts of interference, let alone blatant acts of destruction, actually occur. As the most immediately apparent symptom of an incipient strategic confrontation between the United States and China, the impasse at Geneva is most definitely evidence of ill health

²⁰ Eric M. Javits, U.S. Ambassador to the CD, speech to the “Conference on Future Security in Space,” May 28, 2002, Mountbatten Centre for International Studies, South Hampton, England, available at: <http://www.acronym.org.uk/docs/0205/doc17.htm>

in the existing system of rules for space. Any doctor who ignored a comparably ominous symptom in an individual patient would be subject to a ruinous lawsuit.

If China or any other country were actually to pursue a strategy of negation, as distinct from merely keeping that option open, and were to do so skillfully, presumably it would begin with low-level acts of interference with space activities that would be designed to convey warning while minimizing provocation. Precisely because of the importance and the fragility of the regulatory rules, the strategy of negation would be dangerous to the initiator as well as the target, even in its earliest detectable stages and would become much more mutually dangerous if it had to be played out to some decisive conclusion. An adroit negation strategy would be designed to achieve early accommodation and would absolutely have to establish broadly accepted justification. Otherwise the actions designed to exert countervailing pressure could result in political disaster. The problem, of course, is that subtle warnings are often discounted or not perceived at all, whereas acts of provocation stark enough to command attention tend to induce belligerent reaction. Getting the balance exactly right is something like walking a tightrope in a variable wind. Since there are few indications in the public record that acts of interference against satellites have yet been specifically threatened or actually undertaken, it is reasonable to conclude that the strategy of negation is an option but not yet a commitment for any major country.²¹

It is prudent to assume that unrelenting pursuit of the American military program as it is currently being projected would eventually trigger a negation strategy, probably pursued by China, but it is also plausible to hope that a more constructive outcome can yet be achieved. It is also plausible to attribute sincerely constructive intention to current Chinese policy.

At this point the provisions of a constructive outcome would be difficult to determine in detail but are fairly apparent in broad outline. If the incipient collision of policy is to be gracefully avoided, existing space regulations would have to be elaborated and formalized to accomplish two related purposes: 1) categorical prohibition of the destruction of space assets or direct interference with their legitimate functions; and 2) more refined specification of the limits of permissible activity. That latter provision would be especially controversial in the United States at the moment and the relevant details are likely to be especially difficult to work out. Basic common sense suggests, however, that tolerance of space activities will ultimately depend on credible assurance that they are not unacceptably intrusive. Presumably current levels of capability can be accommodated indefinitely, and in some areas, such as communication relay, there is no apparent reason to anticipate imposed limitations. With regard to multi-spectrum observation, however, and perhaps electronic intercept one can project the evolution of capability to levels that would require some regulatory limitation. If navigation services are to be protected, moreover, some understanding will have to be reached about their utilization in precision attack operations. Over the longer term, assets that are as consequential and as vulnerable as those in space are will have to be broadly legitimized in order to be sustained. Obviously national dominance is not a viable basis for international

²¹ Much has been made recently of Iraqi efforts to jam GPS receivers during the war and of allegations that Cuba has been jamming expatriate satellite television broadcasts into Iran, but these are isolated, relatively low-tech acts of interference. See David A. Fulgham, "War Shapes New Products," *Aviation Week and Space Technology* 158:24 (June 16, 2003), p. 152 and Henry Hamman, "Jamming of Satellite Broadcasts puts Spotlight on Cuban-Iranian Ties," *Financial Times* (July 21, 2003), p. 6.

legitimacy. In the end a more inclusive formulation of purpose will have to be devised, and in all probability a more equitable distribution of the benefits of space services will have to be worked out.

An Image of Constructive Transformation

The term transformation, as it is used in United States military planning documents, generally refers to all that is involved in making military operations more effective — the application of advanced technology certainly but also the evolution of doctrine, training, and mission conception to produce more decisive capability. The implicit assumption is that more decisive capability, as measured against the capacities of potential adversaries, will assure greater security for the United States and for those to whom we chose to extend protection. In that usage transformation is not a comprehensively inclusive term, and it poses the question how the security of the United States and its allies relates to international security generally. Since those formally included in the United States alliance system are a declining fraction of the world population — no more than 30% at the moment — that is a serious question for everyone involved. The current military planning presumption is that the United States can and must preserve a competitive edge indefinitely and that the security of anyone outside the U.S. alliance system is not a vital national concern. That is said to be a realistic perspective. The possibility that transformation so conceived might stimulate major threats that might otherwise be avoided is not currently being considered. The possibility that the security of the United States ultimately depends on the security of everyone else is essentially ignored. Such a thought is said to be unrealistic.

It is admittedly difficult to be objective about the organizing presumptions of security policy. They are at least as much the product of emotional commitment as they are of reasoned conclusion, and their ability to inspire intense commitment is essential in establishing the consensus necessary to conduct coherent policy. Intrinsic validity is not the only question. There are fundamental issues of social value involved. To the extent that one can imagine the perspective of an intimately informed but emotionally detached observer, however, it seems apparent that the realism of the realists would have to be very sharply questioned. Over time, technology developed in the United States will assuredly diffuse to the rest of the world. If the context for that diffusion is competition in intimidation, the inherent vulnerability of the United States will be a rising danger, potentially an unmanageable one. Transformation as currently being practiced carries an appreciable risk of ultimate doom. If the United States political system cannot recognize that risk and cannot confront the implications, its viability will be very much in question. All of which is to say that the exploration of alternatives can fairly be considered a vital obligation, and that might usefully begin with a broader notion of transformation.

If it is to be globally constructive, the term transformation would have to be applied in the first instance not to the instruments of coercion but rather to the central purpose of security and to the fundamental principles on which the conduct of security is based. The spontaneously integrating character of the global economy, the issues of equity and social coherence generated by the pattern of economic activity, the environmental implications of aggregate human activity, and the momentum of technology — of biotechnology in particular — all suggest that global security will have to become the dominant objective and that security policy will necessarily have to be comprehensively inclusive. That further implies that policy will have to be based on principles that

can inspire something approaching global consensus and can manage the emerging threats of smaller scale violence as well as the traditional ones of larger scale aggression.

For some indefinite period, the United States military will be able to prevent large scale forms of aggression on a global basis. If that capability is to be accepted as legitimate and preserved at reasonable cost, however, the scope of application and the basis for justification would have to be altered. Protection against hostile invasion would have to be generally extended. It could not be restricted to the current alliance system. Principles of active confrontation, designed to assure that a strong deterrent effect is preserved and that effective preparations are made for predictable conventional force contingencies, would have to be subordinated to principles of reassurance whereby inherently superior United States forces conveyed confidence that they would not themselves initiate attack as long as international standards of behavior are upheld. In order to convey that assurance convincingly, the United States would have to engage with all significant military establishments in the cooperative manner that it currently does only with formal allies. If that is to happen, the United States political system would have to alter its traditional practice of justifying its military effort in terms of designated threats and accept the burden of providing general protection. In doing so it would have to acknowledge that the United States is the dominant source of potential threat for everyone else and that reassurance is as important as deterrence. Those are difficult but ultimately necessary conceptual and political adjustments, simply to sustain the traditional commitment to preventing major war.

The problem of dealing with civil violence and clandestine terrorism is yet more demanding, since deterrence and defensive reaction are both more difficult and prevention therefore more important. Basically, effective prevention requires not merely the conveying of reassurance but direct collaboration in the control of what is determined to be intolerably criminal activity. The first step in that regard is to define fundamental and universal standards of behavior widely enough accepted that powerful methods of mandatory transparency and enforced compliance can be globally applied without exception. The necessary accompanying step is to devise appropriate limitations and other forms of legal protection sufficient to assure that those methods of prevention do not themselves become a menace. The standard of behavior most likely to achieve universal adherence would be a prohibition of preparation for acts of truly massive destruction. That rule might be primarily directed against the speculative possibility of catastrophic terrorism but presumably would have to be applied to the legacy practice of deterrence as well. It is also prudent to assume that the capacity for precise coercion, which might be necessary to enforce a preventive regime, would have to be globally regulated.

The most critical immediate test of those broad principles and of the process of transformation generally is presented by the situation in North Korea. The currently declared intention of the DPRK to proceed with the production of plutonium and the imputed intention to produce highly enriched uranium is the first explicit challenge to the American policy of preventive coercion. The eventual outcome will determine whether that is indeed an operational policy or a lesser political exercise largely confined to the case of Iraq. Since the declared North Korean intention has also been accompanied by a stated willingness to contemplate the negotiated dismantlement of the nuclear materials production complex, however, there also appears to be a constructive opportunity. Whatever happens on the Korean peninsula — a preventive attack, successful defiance of that threat, negotiated dismantlement, or some change of political regime —

the conditions of global security will be generally affected. An image of constructive transformation reasonably and perhaps necessarily begins with an outcome in North Korea that demonstrates the underlying principles.

Such an outcome would involve a comprehensive settlement under which North Korea would dismantle its nuclear materials production facilities, terminate its ballistic missile development and export programs, redeploy its conventional forces — its artillery in particular — away from the DMZ and out of immediate range of Seoul, and submit to verification procedures sufficient to document compliance with these provisions. In exchange, the North Korean government would be granted full political normalization, all economic sanctions would be removed, substantial assistance for economic regeneration would be offered, and security guarantees would be credibly issued and actively practiced by the United States. That arrangement would be endorsed and implemented not only by the six neighboring states currently involved in diplomatic discussions — China, Japan, Russia, and South Korea in addition to the United States and North Korea — but also by all states parties to the Nonproliferation Treaty (NPT) and by the international financial institutions. In the event that the nuclear reactors promised under the 1994 Agreed Framework are ever completed, the fuel would be under direct international control at all times, and that would become the new standard for all new nuclear reactors worldwide.²²

A comprehensive settlement of this sort goes well beyond what has been considered in any documented official discussion, and it would be considered unrealistic by most of those who have participated in those discussions. The grounds for objection have much more to do with prevailing political attitudes, however, than with real interest. It seems evident that security for all parties would be substantially improved under such an arrangement. The provisions are in fact less fanciful than the United States imagining the enduringly decisive conduct of preventive war at acceptable cost, or North Korea imagining it could safely prosper by exporting nuclear materials and ballistic missiles while fending off the United States with nuclear threats, or anyone imagining that North Korean society will undergo a felicitous internal transformation unassisted. Nonetheless with current policy dominated more by political attitude than by real interest, a comprehensive arrangement is not likely to emerge from either the United States or North Korea. Any exploration of a general settlement would have to be initiated by someone else, most plausibly China. With the breakdown of the Agreed Framework, China has already become procedurally more active in promoting and organizing official dialogue among what is coming to be called the group of six. It is admittedly a stretch but not an inconceivable one that China, concerned about the implications of an unraveling situation, might become substantively more venturesome as well.

Whatever the outcome in North Korea proves to be, its global implications will be affected by the handling of Iran's nuclear material production activities, and a strategy for constructive transformation would reasonably aspire to make that situation a reinforcing precedent. In a report issued in November of 2003, the Director General of the International Atomic Energy Agency

²² It is reasonable to speculate that as part of a comprehensive settlement of this sort North Korea would be provided a modernized power grid integrated into outside sources as a form of economic assistance that could be accomplished much more rapidly than reactor construction. Even in that were to occur, however, the North Korean government might well insist on the right to the reactors in principle, in which case the provisions for international control of the fuel cycle would be relevant. Internationalizing control of the nuclear fuel cycle would be a much higher standard than current NPT rules and that fact would be at least part of the answer to those who contend that any compensation for North Korea is unacceptable acquiescence to blackmail.

(IAEA) detailed numerous violations by Iran of its disclosure obligations under the NPT.²³ The report determined that dating back to 1985 and in some instances back to 1981, Iran had conducted technical explorations of “practically a complete front end of a nuclear fuel cycle, including uranium mining and milling, conversion, enrichment, fuel fabrication, heavy water production, a light water reactor, a heavy water research reactor and associated research and development activities,” all of which should have been reported but was not.²⁴ Small amounts of enriched uranium had been produced in prototype gas centrifuges and laser enrichment facilities. Small amounts of separated plutonium had been produced in experimental facilities as well. A prototype uranium enrichment plant and a much larger production facility were revealed to be under construction at Natanz. Although the entire effort had not yet produced enough material for even a single nuclear weapon, completion and operation of the observed facilities would in principle provide the capacity for producing enough material for many weapons. Caught in the subterfuge, Iran officially committed itself to full disclosure including announced acceptance of the additional IAEA inspection protocol (INFCIRC 540) it had resisted up to that point. Under pressure for compliance from Russia, France, Germany, and Britain, Iran also temporarily suspended its uranium enrichment and plutonium separation activities, by implication until the details of IAEA inspection could be worked out. While admitting its violation of disclosure rules, the Iranian government nonetheless insisted that its activities were designed for nuclear power generation only and did not constitute a nuclear weapons program. The United States forcefully alleged the contrary, however, and attempted, unsuccessfully, to have the IAEA Governing Board refer the matter to the UN Security Council for the imposition of sanctions. Eventually, though, the United States compromised with the Europeans and Iran on an IAEA resolution that “strongly deplores Iran’s past failures and breaches,” welcomes its new policy of disclosure, and warns that the IAEA governing board will respond quickly and strongly if any further violations are discovered.

The Iranian admission of disclosure violations and apparent acceptance of more intrusive inspections clearly indicates a change of policy of some sort, but does not resolve the question of underlying intention. Under current NPT provisions it would be legally permissible for Iran to accumulate separated plutonium under full IAEA inspection, as Japan has done, thereby producing a material stockpile that in principle could be rapidly converted into a nuclear weapons arsenal. If the possibility of that development is to be prevented and if the intense suspicion inevitably associated with it is to be removed, then Iran would have to forego the independent production of enriched uranium and plutonium and would have to accept international control of the fuel for any of the nuclear reactors it constructs and operates — the higher standard of control envisaged for North Korea. In accepting that higher standard, Iran also might reasonably demand specific security guarantees from the United States in particular. Because Iran’s inherent economic prospects are much better than North Korea’s, a general settlement package might rely more exclusively on security provisions, but the underlying principle of accommodation would be similar. Were fundamental accommodation to be achieved in both instances, the troublesome concept of “rogue state” might then be retired, and that would be a significant practical accomplishment. Such accommodation is even less likely to emerge from any bilateral interaction than it is in the North Korean case, but the potential mediators are at least as readily identified and already more active. It

²³ *Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran*, IAEA, Report by the Director General (GOV/2003/71) 10, November 2003.

²⁴ *Ibid.* p. 9

is evident that the EU and Russia together could play that role, and the substantive terms of accommodation would be a natural evolution of their current policies.

The other opportunities for constructive transformation are less immediately urgent but more directly global in character. The impasse over a negotiating mandate for PAROS and the failed effort to devise a verification and enforcement protocol for the BWC have already engaged the general diplomatic community in a struggle with the United States over basic security principles. In both instances the United States, acting essentially alone, has blocked widely supported efforts to devise protective regulation, and those actions are now interpreted to be a diplomatic extension of the preventive coercion doctrine. Recognizing that unusually powerful common interests are engaged in both circumstances, strategists for constructive transformation could plausibly seek to mobilize frustrated international sentiment and could eventually expect to induce resonance within the United States as well. In more mature phases of such an effort, there would have to be active official champions urging protective oversight provisions for biotechnology and offering candidate schemes for space regulation. Such efforts usually originate with less formal, more spontaneous discussions, however, of the sort that are already occurring among like-minded countries and in track-two meetings of professional societies. One can reasonably imagine a constructive program with general conceptual coherence emerging from exploratory efforts currently being undertaken on both topics that are not yet visible in public discussion. Not everything of significance is recorded in the daily news services.

It is certainly true nonetheless that very prominent and presumably very extensive public discussion would be required if constructive transformation were actually to be accomplished or even seriously attempted. The idea would have to be put in circulation in engaging detail if security policy is to be meaningfully effected, and that would require official advocates who are forceful, consequential, and adroit enough to command global attention. It is not reasonable to impose that expectation entirely on China, despite its incentive and inclination, but it is more reasonable to imagine productive collaboration between China and the members of the EU and the OSCE on the relevant topics. The basic principles of constructive collaboration for mutual protection have been most significantly developed in Europe over the course of the Cold War and thereafter. It is that legacy adapted by China and extended to Asia that offers the most promising vision of constructive transformation.