

March 19, 2008

REBALANCING AMERICAN SECURITY POLICY

Paper prepared for the International Track Workshop

AAAS – APS Study of United States Nuclear Policy Options

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RELEVANT FACTS AND REASONABLE PRESUMPTIONS

Reduced to its bare fundamentals, security policy is always based on some blend of the capacity to exercise force and the ability to establish consensual accommodation. Neither ingredient can entirely substitute for the other, but most of the world's governments are forced to rely primarily on rules of accommodation since they do not have and cannot afford the extent of military power that would be required to defeat the attacks a few major governments could in principle undertake. For the United States, however, there is broader scope for argument over the appropriate degree of reliance on these two fundamental determinants. With its own territory essentially invulnerable to any incursion that could contest sovereign control and with a military establishment uniquely capable of global operations, the United States is better able to rely on the unilateral exercise of force to achieve its security purposes than is any other government. That does not mean that self-reliance is a superior or even a feasible basis for security policy even for the United States, but it is more of a question.

The Bush administration has attempted to settle that question by asserting a policy of nearly exclusive self-reliance. As the foundation for that policy the administration has sustained military investment at a rate many times greater than any other country and roughly comparable to the rest of the world combined. At its cutting edge, the administration

- has repudiated legal agreements long considered to be the foundation for international regulation, the ABM treaty and the Comprehensive Test Ban Treaty (CTBT) in particular;
- has blocked all efforts to pursue additional international agreements and has largely dismantled the diplomatic machinery that once supported those efforts;
- has issued an official declaration of policy by the President asserting the right and declaring the intention to initiate the use of force, including nuclear weapons if necessary, to prevent any state it considers hostile from acquiring weapons of mass destruction.

As a demonstration of the policy, the administration forcefully removed the government of Iraq without international authorization to do so, an action that was considered by much of the world to be a violation of the most basic principle of the UN Charter. And as a particularly provocative extension, the administration has issued a series of planning documents indicating the intention to dominate space for national military advantage and to control access by all other countries, in violation of the basic principles of the 1967 Outer Space Treaty (OST).

This formulation is a radical revision of American security policy, which has traditionally featured legal regulation and political accommodation as significant supplements to preparations for military engagement. In the emotional and highly permissive atmosphere created by the events of 9/11 essentially no fundamental questions have been raised, but that passive tolerance cannot last indefinitely. Global dominance is far too provocative and ultimately too unrealistic an aspiration to be literally achieved. At some point the increasingly vital interest in establishing viable rules of accommodation will have to be acknowledged, and the considerable conceptual and institutional effort required to develop those rules will have to be organized. Wielding coercive force is of declining utility under the conditions of globalization. Establishing and defending the rule of law necessary to assure global economic performance is in fact the emerging interest of overriding significance.

It is prudent to assume that the American political system will eventually be compelled to recognize that emerging interest and to rebalance its security posture. As that recognition dawns, there are six substantive priorities that provide strong motives and natural focus for the necessary redirection of specific policies:

1. A transformation of deterrent force operations.
2. The establishment of a global system for accounting and physical control of nuclear weapons and explosive isotopes that would eventually enable higher standards of managerial control.
3. Resolution of the two principal problems of proliferation, Iran and North Korea.
4. The development of new reactor designs, fuel cycle management practices and fundamental security relationships necessary to enable a large expansion of nuclear power generation in response to global warming.
5. The development of arrangements for oversight and reassurance sufficient to prevent the application of advanced biotechnology to destructive purposes.
6. The development of rules regulating the use of long range, high precision attack capability.

The first four of these priorities are so closely related that they might be considered to constitute a single topic – the management of nuclear technology. The other two have distinctly different features, but would have to be included in a comprehensive arrangement for the control of nuclear weapons. All are likely to involve a similar revision of basic principles and the development of new techniques of protection.

SUBSTANTIVE PRIORITIES

Deterrent Force Operations

As a practical matter, the respective deterrent forces of the United States and Russia set the basic condition of global security in that they possess what is by far

the largest potential source of destruction. The two coupled forces are widely considered to have established a stable balance of power arrangement, with each providing a global check on the other. Since that assumption has self-reinforcing features, there is an incentive to preserve it as long as the forces are active, but in fact it is doubtful that the deployment configuration meets the technical requirements of stability. The US force has sufficient preemptive capability to put the Russian capacity for retaliation under some question, a fact that during the Cold War period would have been the occasion for very active diplomacy. Under its recent, assertively self-reliant policy, the United States apparently considers the disparity to be a legitimate advantage and at any rate does not appear to have accepted any direct discussion of mitigating it. As best can be judged from the public record, the Russian government has not pressed the issue directly, but it is evident that their vehement objections to United States ballistic missile defense installations in the Czech Republic and Poland are related to the underlying problem.

Institutionalized policy in the United States currently envisages indefinite continuation of legacy operational practices under which American deterrent forces

- systematically prepare massive attack plans independent of any immediate circumstance of possible use,
- direct those attack plans primarily against Russian and Chinese military forces
- maintain thousands of weapons on immediately available alert status capable of covering primary targets.

It has long been recognized that those forces are technically configured and operationally inclined for preemption, despite the commitment to retaliation required by formal deterrence doctrine, for the basic reason that the priority purposes of the underlying attack plans can only be achieved if most of their specific missions are preemptive in character. Given the disparity in investment, the United States capacity for preemption will continuously improve, forcing Russia into increased reliance on rapid reaction of its deterrent force and even

anticipation of attack in order to assure itself that the American preemptive potential could not be completely decisive.

The American public has little detailed understanding of this situation, but the political system as a whole appears willing to continue legacy practices indefinitely. Four prominent figures have recently supported the ultimate objective of eliminating nuclear weapons but have not advanced a program that would meaningfully alter the prevailing configuration of forces anytime soon. This apparent acquiescence does not preclude fundamental redirection, however. Dramatic revisions of legacy practices must be considered possible and eventually even likely for three basic reasons.

First, the magnitude of threat embedded in the operational forces does not remotely fit the deterrent rationale. Under current political circumstances it is not credible to claim that an adequate deterrent effect – that is, one necessary to dissuade a rational actor from initiating attack – requires threatening massive retaliation from thousands of nuclear weapons. To the extent that an explicit retaliatory threat is required at all, it certainly could be achieved with tens of weapons targeted in response to immediate circumstances and probably less than ten would be sufficient. The wielding of thousands of preprogrammed weapons projects an intention to preempt rather than to deter, and that intention will never be considered legitimate from a global perspective. The United States is not independently strong enough to defy global opinion indefinitely.

Second, the continuous coupling of large alert forces programmed for massive attack certainly enables a catastrophic accident to occur. One can argue about the probability of such an event and one can hope that it has indeed been rendered very small by measures designed to assure central control, as responsible officials regularly assert. There can be no credible categorical assurance, however. Indefinite continuation of legacy practices entails some risk of catastrophe that is essentially impossible to quantify and difficult to judge. If adequate deterrence can be achieved without running that risk, there is no justification for doing so.

Third, the dispersed pattern of weapons deployment resulting from legacy operations entails a greater risk of terrorist access than would be the case in a more protected configuration of forces. To the extent that deliberate assault from

apocalyptic terrorists, who could not be identified or located in advance, is considered more likely than deliberate attack from any state leader who could be so identified, there is reason to shift to a more protected deployment pattern.

Most individuals not embedded in the contemporary security bureaucracies readily identify an inherently superior configuration of deterrent forces involving hundreds rather than thousands of weapons that are not programmed for attack, are held in secure storage and are never put on immediately available alert status unless their actual use is immediately intended. Suitably designed and supported by continuous monitoring, that configuration of forces would render any residual disparity in preemptive capacity far less threatening, would eliminate the risk of catastrophic accident and would provide robust deterrent potential that could be specifically activated in any situation that appeared to require it. Moreover, by putting all nuclear weapons into secure, continuously monitored storage, that force configuration would also establish much higher standards of protection against unauthorized access.

Although such a transformation of prevailing practice is easily conceptualized, it would be difficult to accomplish. It would involve extensive institutional adjustments in Russia and in the United States and those adjustments would have to be carefully coordinated. Direct discussions between the two governments would be an essential first step, and formal negotiations would eventually be necessary. A complete arrangement would ultimately require the agreement and alignment of the other nuclear weapons states as well, but it would be important for Russia and the United States as the main protagonists to initiate a process of progressive restraint on their forces. That would logically entail:

- Gradual removal of fabricated weapons from operational status to secure storage separated from delivery systems with associated verification arrangements;
- Initiation of an international identification and continuous monitoring arrangement that in full maturity would provide the basis for accurate accounting and assured security of all fabricated weapons and explosive isotopes;
- Reduction in the size of total stored national weapons stockpiles significantly below the asymptotic limit of mass social destruction (variously estimated in the range of 1000 – 2000 targets).

- Categorical prohibition of any initial use or threat of use of a nuclear weapon for any purpose.
- Corresponding prohibition on the **unauthorized** initial use of conventional weapons for any offensive mission.

The rebalancing of American security policy will require the organized pursuit of these measures, including formal negotiations designed to bring them about.

Global Accounting¹

In the process of developing the existing deterrent forces, more than sixty thousand nuclear weapons are believed to have been fabricated over the course of six decades, and a network of facilities has been established to produce the explosive isotopes they contain. Those facilities are embedded in the larger network that supports the 442 nuclear power reactors currently in operation throughout the world. Although nine principal isotopes have been identified that can sustain an explosive chain reaction well enough to be the basis for weapons designs, Plutonium 239 and Uranium 235 have so far been by far the most extensively used for that purpose. The combined global stocks of Plutonium and Highly Enriched Uranium (HEU) are estimated to be at least 1800 metric tons, in principle enough for more than 150,000 weapons.

Accounting and physical security for weapons actually fabricated and for their dedicated materials has been handled by separate national governments who do not inform each other in authoritative detail. As a result no one knows the total inventory. The United States government estimates of the number of nuclear weapons that currently exist has an uncertainty range of 5000, even though each single weapon is itself an agent of mass destruction. The IAEA monitors most but not all of the materials involved in nuclear power generation but does not claim to provide a comprehensive, exactly accurate account of the current global inventory let alone the history of explosive isotope production. The uncertainties of historical production are such that it is inherently doubtful a global account accurate to a

¹ Adapted from John Steinbruner, "*Burdens of Proof*," *Bulletin of the Atomic Scientists*, vol. 63 # 1, January/February 2007, pp 59 - 61.

single weapons unit of material could ever be constructed. Legacy practices have disseminated nuclear explosive materials in an extent that apparently precludes exact knowledge of the threat they represent.

During the period when deliberate mass attack was considered to be the dominant form of threat, uncertainty about individual weapons did not appear to be significant. With thousands of weapons arrayed in active confrontation, there was no reason to believe that the viability of deterrence depended on the exact number. If terrorist use is admitted to be a serious concern, however, the accounting and physical security of every weapon and the equivalent amount of explosive material become matters of priority. Although it may never be possible to achieve an exactly accurate global system of managerial control, substantial improvement in current practice is definitely possible and is likely to become an insistent demand if ever there is an incident that validates fear of a terrorist threat.

It is technically possible to devise a common accounting and physical security system that would assure continuous monitoring of weapons and materials in secure storage and would make unauthorized and undetected diversion extremely difficult to accomplish. Such a system could establish international standards while controlling access to the details of design and location national governments are dedicated to protecting. The development of such a system lies outside the bounds of political tolerance at the moment, but if the imagined threat of terrorism is ever demonstrated to be real prevailing attitudes would presumably be revised.

Even a fully developed international accounting process would have to operate over many years, probably decades, before uncertainties regarding historical production receded to the point of relative insignificance and confidence in its accuracy and inclusiveness became established. For that reason it is important to begin formal diplomatic discussions of such a system, involving all of the states that are currently believed to possess fabricated weapons as well as those whose explosive isotope inventories provide the basis for rapid weapons deployment. Those discussions would be another essential first step in a process of transformation.

Control of Proliferation

The Nonproliferation Treaty (NPT), which was pioneered by the United States in the late 1960s, has subsequently become one of the most widely endorsed international agreements. Since its entry into force in 1970, the NPT has gained nearly universal adherence and has been extended by consensus indefinitely beyond its original 25 year duration. There are currently 190 states parties to the treaty, at least nine of which have reversed national nuclear weapons programs that would have precluded their adherence as non-nuclear weapons states. Two instances of clandestine violation of the treaty – South Africa and Iraq – have been reversed. All four of the countries that do not currently adhere to the treaty -- India, Pakistan, Israel and North Korea -- are credited with having nuclear weapons in some sense, but that limited set of exceptions has so far not overturned the prevailing norm against the acquisition of nuclear weapons. There are many parties to the treaty who could more readily develop weapons than the four current exceptions, but none have chosen to do so.

Despite the evident strength of the NPT regime and the underlying norm it reflects, it is nonetheless considered susceptible to radical breakdown for three basic reasons. First, the five states authorized by the treaty to deploy nuclear weapons on an interim basis have not seriously pursued the obligation to eliminate them explicitly expressed in Article VI of the treaty. Of the 13 criteria specified at the 2000 review conference as indication of a good faith effort, several have been explicitly repudiated by the United States, a fact that prevented the 2005 review conference from establishing an agenda, holding substantive discussions or issuing a report. There is justified concern about backlash at the 2010 review conference. Second, there is an evident flaw in the treaty in that it allows any state to acquire nuclear explosive materials as long as their holdings are documented. That enables a willful rogue to develop a materials stockpile under legal protection and then abandon its obligation not to develop weapons by evoking the three month withdrawal clause provided by Article X of the treaty. With a sufficient amount of Plutonium or HEU available, most advanced industrial states could fabricate viable weapons within a year. Third, there is perceived danger that regional resonance of the Indian, Pakistani and Israeli nuclear programs might so undermine the global arrangement that it cannot be sustained.

Serious discussion of deterrent force transformation and of a global accounting arrangement would respond to the first concern and would presumably enable a constructive review conference to be held in 2010. Deterrent force transformation and global accounting are almost certainly necessary conditions for any credible effort to approach ultimate elimination and would be recognized as such. Dealing with the other two concerns, however, will predictably require some specific resolution of the Iran situation. Iran is currently suspected of intending to exploit the NPT flaw. Were it actually to do so, the regional reverberations would be extensive and dangerous.

In terms of technical capability, Iran is a much less immediate threat to the NPT regime than is North Korea. The DPRK, which formally withdrew from the treaty in 2006, is credited with having more than 40 – 50 kg of separated plutonium and has at least nominally demonstrated the capacity to fabricate weapons out of that material. North Korea has agreed in principle, however, to dismantle its entire nuclear program and has shut down its 5 MW reactor at Yongbyon. The detailed schedule for pursuing the dismantlement process is currently delayed by a dispute between the DPRK and the United States regarding disclosure of all their nuclear activities, but there is good reason to believe that an authoritative rebalancing of American security policy would enable the agreement with North Korea to be completed. The difficulties of implementation have as much to do with undisciplined political antagonism in the United States as with intransigence in North Korea.

In the case of Iran there is no agreement in principle on the terms of a settlement and no direct negotiations or even background discussions with the United States. Iran has repeatedly denied any intention to develop nuclear weapons but since 2006 has also defied all international appeals to suspend its uranium enrichment and plutonium reprocessing activities, including UN Security Council resolution 1696 issued in July 2006. Iran had earlier admitted to the IAEA in 2003 that it had conducted uranium enrichment and plutonium separation experiments dating back to 1981 and had failed to disclose them as required by its safeguards agreement. Iran suspended its enrichment and separation efforts in 2003 and agreed to comply with the more intrusive IAEA inspection procedures established by the Advanced Protocol. The US intelligence community has recently stated that Iran also

terminated a clandestine nuclear weapons design program at that time. The defiance that began in 2006 thus reversed an earlier policy of accommodation. One can speculate about the reasons, but it is worth noting that over its two year duration the policy of accommodation elicited no commensurate reaction from the United States.

The current impasse creates an inherently volatile situation. Because of Iran's extensive exposure to IAEA inspection, a great deal is definitively known about the state and location of Iran's enrichment activities. The IAEA reported in November of 2007 that 2952 gas centrifuges were in operation at Natanz and that using UF₆ feedstock from Iran's own uranium conversion facility 4% levels of enrichment had been achieved. It would require 6000 machines of the type observed operating at full capacity for a year to produce enough HEU (60 kg) for a nuclear weapon equivalent to the one used at Hiroshima. More recently Iran has claimed possession and mastery of a more advanced centrifuge design said to be capable of producing 60 kg of HEU/ year with only 2400 machines. But even that more "advanced" design is less capable by a factor of 100 or more than the centrifuges currently used in state-of-the-art facilities and hence is very far from being commercially competitive. That suggests that the production of HEU for weapons application may be the ultimate intention and that Iran might have the capacity to do so within a few years. It also suggests that an attack on the Natanz facility and perhaps on the uranium conversion facility as well would significantly delay Iran's acquisition of weapons capability. Since both the United States and Israel have the capacity to undertake such an attack and are believed to have some inclination to do so, there is some urgency in devising a more constructive solution.

As with the transformation of deterrent operations, the basic elements of a solution are readily apparent, and in fact they are officially outlined in the agreement with North Korea – the September 19, 2005 Joint Statement of Six Party Talks. The basic requirement accepted by North Korea in that document is complete dismantlement of their nuclear materials production facilities and transfer of their accumulated plutonium stocks to international control in exchange for security assurances from the United States and normalization of political and economic relations. Implied in the outline of the arrangement is the requirement that North

Korea cede the right to national control over nuclear materials in exchange for assurances of equitable – that is, de-politicized – access to international fuel cycle services. Were that to become the new standard for any additional country proposing to develop nuclear reactor technology, it would close the loophole in the NPT.

Extending that formula to Iran would require the United States to offer security assurances – that is, a commitment not to initiate attack – which Iran would probably insist be ratified by the international community generally. It would probably also require some adjustment for the fact that Iran has not yet mastered uranium enrichment technology and therefore has not established the hedge of knowledge that North Korea has established with regard to plutonium production. One can imagine an outcome in which Iran is allowed to operate the Natanz facility under Advanced Protocol inspection provided that enrichment levels do not exceed, say, 5%, that overall production does not exceed, say, 50 kg/year and that all enriched product is placed under international control.

Since the United States has not offered to Iran the security assurances and full normalization of relations it has offered in principle to North Korea, there has not as yet been a fair test of Iranian intentions. If that offer were credibly made along with assurances of access to nuclear fuel cycle services, there would be no good reason for Iran to refuse it. Even if Iran does harbor some underlying inclination to pursue a nuclear weapons option, it has in fact very little prospect of succeeding. Given the repeated denials that its leaders have issued and given the regional reverberations that would result, a suddenly announced or independently discovered Iranian nuclear weapons development effort would not be considered legitimate and would be exposed to preemptive attack. Given those circumstances accommodation with Iran using the formula developed for North Korea has very good prospect of succeeding and of thereby solidifying the NPT regime to the extent that any additional defections become very unlikely.

Global Warming²

The problem of global warming has some potential to become the dominant, organizing concern that fear of massive imperial assault was from WWII up to the end of the Cold War. Although the forces of nature are not considered to be a willful enemy capable of deliberate aggression, they are in principle capable of yet greater destructive consequence, and it is becoming apparent that the effects of aggregate human activity on global ecology are posing major issues of strategic protection for reasons that are evident from a few basic observations.

We are in the midst of a surge in the size of total human population. Barring some unusual calamity, by 2025 six billion people will have been added to the two billion total of 1950 when the surge began. That has driven global economic growth which has in turn intensified the accumulation of greenhouse gases in the atmosphere. It has been determined at a high level of scientific confidence that human induced greenhouse gas concentrations will double over pre-industrial (1750) levels by 2050 and that a significant rise in average surface temperature will result unless offset by some phenomenon not yet identified with anything like the same level of confidence. The amount of the increase is expected to fall in the range of 2-4 degrees Celsius with much larger local variations.

The geological record indicates that substantial changes in global climate patterns could result from average temperature increases in that range, but the magnitude, timing, probability, consequence and even the basic character of those changes cannot be determined with the same level of confidence. By the time such determinations could be made, it would be too late to prevent the more serious of the possibilities that might threaten human societies on a truly massive scale – rapid rises in sea levels, for example, or sudden releases of frozen gas hydrates. To protect against calamity potentially greater than the worst of history's wars, prudence seems to require preventive efforts directed at energy production and use well before the exact dangers can be defined.

² Portions of this section have been adapted from John Steinbruner and Tim Gulden, "The Security Implications of Global Warming" in *Public Policy: Current Thinking on Critical Issues*, Winter 2008, Maryland School of Public Policy, University of Maryland.

Tolerable preventive efforts must assure sufficient energy production, however, to enable rising standards of living among the poorest segments of the world population where more than 95% of the population increase has been occurring. Since the globalizing economy has been concentrating wealth among the very rich, there is good reason to worry about the consequences for social coherence and for the incidence of civil violence and associated terrorism if the poor do not at least experience improvement. In addition to a shared commitment to prevent global destruction, concern for standards of equity creates a strong connection between global warming and security policy as do the potential means for transforming energy production.

In order to keep climate disruptions down to a level to which we can be reasonably confident that humanity can adapt, atmospheric concentrations of greenhouse gasses will have to be held at the doubling over pre-industrial levels that is already essentially unavoidable – that is, at about 500ppm – by 2050. That in turn will require a transformation of the technical basis for energy generation from sources that emit greenhouse gasses (roughly 80% at the moment) to those that do not (currently 20% -- much of which is hydropower which has limited potential for expansion). In order to assure some economic progress at all income and wealth levels as a basic standard of equity, this transformation will have to be accomplished as the overall level of energy production is increased by a factor of 2 – 3 and large efficiency gains are also achieved.

There are five technologies that can in principle enable such a transformation to be accomplished in the time required – wind, solar, biomass, nuclear fission and carbon sequestration. Of these, carbon sequestration is currently the most popular, but it is unlikely to be able to meet the burden of proof that will have to be imposed. Sequestration techniques must demonstrate to a high level of confidence that over the course of several centuries they will not generate slow leaks or sudden surges. If they did, extensive commitment to that technique would be disastrous. Of the other options, nuclear power generation is intrinsically the most promising but would have to meet its own burden of proof; namely, that utilization could be safely expanded by a factor of 5 – 10 without enabling a ruinous process of nuclear weapon proliferation. Concern about proliferation applies not only to

potentially belligerent states but also to assuredly belligerent terrorist organizations.

The option of nuclear power generation cannot meet that burden of proof on the basis of current reactor designs, current fuel cycle management practices and current international security relationships among the critical participants – the US, the EU, Russia, China and India. Expansion on that basis would entail too grave a risk of dangerous proliferation to be sustained. There are technically viable reactor designs, however, that would be substantially more resistant to proliferation dangers, in particular designs in which the fuel would be sealed within the reactor for the duration of its service. Those could be manufactured in small 50 or 100 MW units at a few internationally managed facilities, shipped to the location of use in whatever numbers would be required for that location, and then returned to the original manufacturing facility for disposition of the used fuel. Development of those designs in combination with internationalized control of fuel services, a comprehensive nuclear materials accounting system, and transformation of deterrent force operations would create conditions under which the burden of proof could be met. That combination of circumstances would make the expansion of nuclear power generation a viable option, and it will be difficult to contain global warming without it. Although wind, solar and biomass will undoubtedly developed and utilized, they are unlikely to be alone sufficient.

Of all the substantive incentives for a more accommodating reformulation of security policy, global warming seems likely to be the most powerful over the longer term. It is reasonable to expect both that the problem itself will become a riveting concern at the head of state level over the next decade and that the implications for the management of nuclear technology will become sufficiently imposing to override the entrenched resistance of legacy policies.

Biotechnology³

³ For more extensive discussion see John Steinbruner, Elsie D. Harris, Nancy Gallagher, Stacy M. Okutani, *Controlling Dangerous Pathogens: A Prototype Protective Oversight System*, Center for International and Security Studies at Maryland, University of Maryland, March 2007

Progress in understanding basic life processes at the molecular level has been especially dramatic in recent years as intricate details have been revealed about operations of the human immune system and strong hints about the regulation of cognitive, emotional and reproductive functions have emerged as well. The degree of understanding achieved is certainly not complete, but it is advanced enough to indicate that extraordinarily powerful applications are likely to become possible. One can plausibly imagine the eradication of historical diseases, but unfortunately one can even more plausibly imagine the creation of diseases far more destructive than those that have naturally evolved. Similarly one can imagine both constructive therapy and malign manipulation of behavior on a mass scale. Fundamental science undertaken by a globally dispersed biomedical research community for compellingly justified reasons is enabling highly destructive application as an unavoidable byproduct.

This circumstance imposes an extraordinary burden of management. The momentum of discovery is driven almost entirely by very strong constructive intentions whose legitimacy is beyond question. It would be infeasible and undesirable to try to interfere in any fundamental way. But the destructive implications loom as a danger too massive to be ignored indefinitely. As it becomes evident how hundreds of millions or even billions of people might be put at risk by the deliberate creation of an advanced pathogen, it also becomes important to devise some systematic means of preventing such a development even if no one currently appears to intend it. And there are two competing impulses in that regard. The first is to try to sequester all of the enabling information under national security classification. The second is to force systematic transparency so that the very powerful established norm against destructive application can be applied in timely fashion.

In reaction to the anthrax letters in 2001 the United States has indulged both impulses. It has added more than a billion dollars annually to protective research to be conducted within the public health establishment largely under transparency rules. But it has also initiated a threat assessment program within the Department of Homeland Security designed to identify the technical opportunities that terrorists might exploit. And to prevent said terrorists from exploiting the opportunities identified a substantial portion of the work is to be classified. The

underlying supposition is that the primary threat is posed by implacable terrorists who cannot be restrained by any norm.

As a practical matter, however, that supposition is so questionable that it will not be readily accepted by the rest of the world. It is not widely believed that terrorists are capable of developing advanced pathogens. The research apparatus required to do such a thing entails too much of an investment and too great a risk of exposure for that to be the principal concern. If terrorists do attempt to use biological agents, the overwhelming probability is that they will rely on known agents that can be far more readily acquired, in which case the threat posed is comparable to that of naturally occurring infectious diseases and the appropriate measures of protection involve strengthening standard public health provisions. The greatest concern in that regard involves anthrax, an agent that is readily found in the natural environment but not in a form that enables aerosol dissemination over a large area. By appropriating standard commercial equipment, a terrorist organization might be able to make a preparation of anthrax spores that would put up to a million people at risk in an urban area, but early detection and rapid dissemination of antibiotics would defeat such an attack. It does not qualify as a threat of mass destruction comparable to nuclear explosives or a spontaneously infectious pathogen.

The greater risk is that government sponsored threat assessment programs having identified the method for creating a pathogen that could not be defeated by advanced public health measures will generate programs for exploiting the possibility, most plausibly out of fear that some other government is doing so. Classified threat assessment programs risk triggering that perverse dynamic, which could ultimately have massively ruinous consequences. If that outcome is to be reliably avoided, transparency measures will have to be applied to all threat assessment activities in order to convey reassurance.

In all other human activities where very large consequences are at stake – the handling of nuclear weapons, for example, or the disposition of large sums of money— requirements for independent oversight are imposed as a standard method of protection, and it is predictable that method will eventually be applied to sensitive areas of biological research as well. Since that has to be done on a global basis to be effective, the imperative to work out a robust but also acceptable

oversight arrangement promises to give some considerable impetus to a rebalancing of American security policy.

Precision Attack⁴

The aspiration to dominate space for national military advantage has been stated in a series of military planning documents which also discuss the programmatic implications in extensive detail.⁵ The documents express the intention to develop space assets that can observe threats as they arise, attack them before they are able to inflict harm on the United States, protect the assets that do this and deny similar capability to any other country. Those who understand the physics and economics of space operations can readily conclude that those aspirations cannot be accomplished, in particular that the United States could not prevent the destruction of its space assets if other countries with space launch capability considered them to be unacceptably threatening. It is apparent, however, that advanced sensing, communications relay and navigation services based in space are enabling precision strike missions to be performed at global range. In addition to making standard bombardment missions substantially more efficient, those developments are also enabling forms of retribution and coercive intrusion that were not possible in previous eras.

As the leading and so far the nearly exclusive practitioner of that emerging capability, the United States has been circumspect about it, but there have been some notable demonstrations. In November of 2002, a remotely piloted drone

⁴ For more extensive discussion see Nancy Gallagher and John Steinbruner, *Reconsidering the Rules for Space Security* Occasional Paper, American Academy of Arts and Sciences, 2008

⁵ United States Air Force, Joint Vision 2020 (June 2000); Report of the Commission to Assess United States National Security Space Management and Organization (Rumsfeld Space Commission), (January 11, 2001) ; Joint Chiefs of Staff, Joint Doctrine for Space Operations, Joint Publication 3-14 (August 9, 2002); Air Force Space Command, Strategic Master Plan FY04 and Beyond, (November 5, 2002); United States Air Force Transformation Flight Plan, November 2003; AFDD 2-2.1 Counterspace Operations (August 2004).

aircraft believed to have been operated by CIA personnel destroyed a car traveling in the desert in Yemen that was said to be carrying a known terrorist along with several other people. More recently there have been reports of similar attacks on houses in the remote tribal areas of Pakistan where al Qaeda leaders were said to have gathered. The Yemen incident did not stimulate any prominent reaction and the attacks in Pakistan so far only moderate expressions of concern about sovereign jurisdiction. It is evident, however, that missions of this sort are inherently controversial and that repetition is bound to generate very sharp dispute. The Yemen incident was in effect a summary execution apparently unconstrained by any legal deliberation. It will not be indefinitely acceptable to evade the due process of law simply by evoking the word terrorist. Nor will it be indefinitely acceptable to conduct clandestine lethal attacks on someone else's sovereign territory. Development of remote attack capability without formal legal restraint would subject prominent individuals throughout the world to a continuous threat of assassination and critical infrastructure assets to a corresponding threat of damage. When the United States comes to realize that it cannot indefinitely exercise that capability and also monopolize it, it will itself become exceedingly interested in rules of restraint.

It is not evident what the most appropriate venue for working out rules of restraint would be, but the regulation of space activity would certainly have to be prominently involved. Whether or not space assets are absolutely necessary for precision strike missions, there is a strong presumption that navigation and communication relay services are important, and that makes them vulnerable to antagonistic reaction. For many years virtually the entire international community has been attempting to mandate formal negotiations to update the rules that currently regulate space activity, and the United States has alone been blocking that effort lest it impose restraint on ballistic missile defense development efforts. That stance, which reflects the ideology of self reliance, ignores the broader American interest in protective regulation. United States space assets are the most capable, the most expensive and most vulnerable of those that share the environment. They cannot be defended by belligerent, self-reliant means. They depend on the tolerance of other countries. That fact, in context of the other above mentioned issues, gives very strong incentive not only to agree to formal

negotiations but to seek to establish robust rules against interference with space assets. In order to acquire that protection, the United States will have to accept some restraint on its own actions, as a sensibly balanced security policy would recognize.

CONCEPTS OF THREAT AND INTEREST

The provisions of legal restraint that were developed during the course of the Cold War were intended to limit the capacity of military forces to conduct large scale operations. Imperial aggression on a global scale was considered to be the threat of primary concern, and the initial intent of regulation was to limit that threat. The limits that could be negotiated were so permissive, however, that the offensive potential of the opposing forces was not meaningfully constrained, and the protagonists gradually came to recognize that the organized exchange of information included in the agreements as verification measures had a more significant effect. Those provisions, designed to convey reassurance that the surprise attacks which could in principle be undertaken were not in fact being prepared, were understood to be particularly important. So, for example, the various ceilings on nuclear force deployments imposed by the START I treaty were not considered as important as the provisions of the treaty requiring the reporting of deployment details. And the constraints on conventional force exercises in the European theater with associated reporting requirements were considered even more significant. By the latter stages of the Cold War, the opposing alliances were learning to convey reassurance by exchanging operational information.

In the aftermath of the Cold War it has become increasingly apparent that imperial assault on continental scale is not the security problem of primary concern. The more pressing concerns have to do with endemic violence within sovereign jurisdictions not capable of controlling it. The United States in particular and the international community more generally have been repeatedly and reluctantly entangled in problems of civil conflict over the past 15 years and have yet to master them in any major instance. The scope of effort that would be required has not yet been attempted. The reasons for undertaking that effort have not yet been

clearly enough formulated to provide effective justification. And the implications for legacy security relationships have not yet been understood.

Obviously it is hazardous to attempt to peer through the uncertainties of this situation to imagine eventual outcomes, but it is not impossible. If basic common sense prevails, major governments will come to recognize that they have no good reason to attack each other and compelling reason to collaborate on the control of civil violence. All societies are increasingly dependent on the performance of the global economy for their own internal stability and therefore are increasingly invested in establishing and defending the basic standards of law required to operate a global economy that runs across sovereign jurisdictions. That is a powerful common interest powerfully threatened by the sustained breakdown of legal order in any part of the world. Predatory violence in any location resonates with criminal activity elsewhere, and the balance of legal and illegal activity in the global economy is a matter of truly fundamental concern. The overriding imperative in the new situation is for major governments to stabilize their security relationships and to convey reassurance to each other in order to collaborate in defense of global legal order and ultimately in protection of the global environment.

To the extent those precepts are accepted and dominant common interest is acknowledged, then powerful techniques for conveying reassurance can be brought to bear. The basic requirement is to agree on standards of operational practice that convey reassurance and to set up a regular exchange of information that will convincingly document compliance with those standards. Sophisticated techniques for gathering and transmitting sensitive information and for preventing its misapplication can be applied to all of the substantive priorities mentioned. Once norms of behavior are clearly established and once evidence of compliance is assured, very robust constraints can be achieved. The possibility of implacable terrorists cannot be eliminated but rogue states almost certainly can be.

Admittedly the American political process as a whole does not seem likely to generate an authoritative reconceptualization either of threat or of interest anytime soon. Legacy policies appear to be accepted and relegated to the background under the assumption that the currently dominant concern with terrorism is an entirely

different matter. Nonetheless, as the United States government attempts to cope with the agonies in Iraq and in Afghanistan under a new administration, as it unavoidably must, it will predictably be forced to recognize that very substantial international assistance will be required to have any serious hope of stabilizing either situation and that very substantial adjustment of legacy policies will be required to acquire that assistance. The process pits prevailing attitudes against emerging circumstance. It is prudent to bet on circumstance over the not-so-very-long term.