I. From the Past to the Present

Was the Past a Precedent or an Exception?

In revulsion at the wanton, indiscriminate loss of human life that use of chemical and biological weapons can inflict, and dubious about the military utility of these weapons, nations have agreed to forgo their possession and use. These norms of non-possession and non-use are broadly endorsed and honored by most nations, but some honor them only in the breach, especially as regards enforcement. Evidently such formal agreements or treaties, while necessary to establish standards of behavior, alone are not sufficient to ensure full compliance.

The treatment of nuclear weapons has been different. These weapons have not been outlawed and their use has not been prohibited. Tens of thousands of nuclear weapons exist, and some nations, including the United States and Russia, have declared that they feel free to use them to meet a serious attack, whether nuclear or not. This is not a reflection of indifference about their destructive potential. It has happened because, almost from their inception, nuclear weapons formed the central pillar of the bipolar structure of the Cold War. Seeing this, non-nuclear weapon states concluded that the non-proliferation regime was inherently discriminatory; naturally they pressed the five original nuclear powers—the United States, the Soviet Union (now Russia), the United King-

dom, France, and China—to reduce their nuclear arsenals and their reliance on these weapons.

The Soviet Union and the United States, over the years of their bitter competition, each built many thousands of nuclear weapons and mated them with the most advanced means of delivery that they could devise. The number of nuclear weapons grew rapidly during the 1970s as new technologies led to the deployment of multiple highly accurate warheads on individual missiles (MIRVs). This trend was reversed in the late 1980s by the landmark agreement between President Ronald Reagan and Soviet President Mikhail Gorbachev to eliminate intermediate-range ballistic and ground-launched cruise missiles, and to advance the negotiations that led to START I, both of which are still in effect. But despite this, nuclear weapons remained of central importance in the war preparations of Moscow and Washington, and remain so today. War planning in the United States included repeated nuclear strikes as part of a doctrine of "protracted nuclear war," endorsed by President Jimmy Carter. Similarly the Soviets wrote about warfighting and war-winning nuclear use doctrines. Throughout the nuclear era, however, elaborate measures were taken on both sides to ensure that nuclear weapons would not be used except under the direst of circumstances and only as directed by the heads of government and top military commanders. Many of these measures were administrative assignments of authority and procedures to assure positive control. Others were technical or physical features that would prevent unauthorized persons from gaining access to nuclear weapons or from detonating them if they did. Some were in the military or intelligence fields, ensuring the accuracy of information about the

actions and intentions of the adversary and avoiding direct military combat at any level.

The Soviet Union and the United States followed these and other procedures independently of the other but not completely autonomously. There was an awareness of what the other was doing; certain expectations developed on each side about the proper control of nuclear weapons. This system of parallel restraint broke down only once in a way that threatened war—the Cuban missile crisis of 1962. A notable example of parallel unilateral measures was the decision by President George H. W. Bush in 1989 to withdraw U.S. tactical nuclear weapons from forward deployment, shortly thereafter reciprocated by President Gorbachev for the Soviet Union.

The United States and the Soviet Union also sought to regulate their bilateral nuclear competition through treaties. Those agreements formalized the idea that relations between heavily armed adversaries could be cooperative, as well as competitive. Even though these treaties were accompanied by occasional real and alleged violations, they provided valuable predictability, reinforced parallel practices, and heightened the two nations' awareness of each other's military thinking. It is not at all clear that the kind of feedback loop that existed between the United States and the Soviet Union will inform the actions of other interacting nuclear weapon states. Of course, the leaders of India and Pakistan understand very well the principles of strategic stability. In fact, they have declared explicitly that they will follow them. But the deep hostility between them has so far prevented the kind of adversarial cooperation that makes effective arms control possible. The same can be expected in other regions.

The Soviet Union and the United States also worked together to shape the global nuclear environment in which their competition took place. Their efforts were generally, although not always, aimed at preventing nuclear proliferation. Nothing like that is happening in the case of India, Pakistan, and China and would be most unlikely to happen in the case of North Korea and Iran. The United States and the Soviet Union each created alliances that had the effect of extending nuclear deterrence to other countries. In the case of American alliances, both in Europe and in Northeast Asia, governments that might have decided to build nuclear weapons relied on the U.S. nuclear deterrent instead of their own. The United States and the Soviet Union cooperated to slow down or prevent the acquisition of nuclear weapons by third countries. They did this through treaties open to all nations, such as the limited nuclear test ban treaty and the nuclear Non-Proliferation Treaty. They also collaborated in denying technology and nuclear materials through their own national export controls and through guidelines developed with other nations. When the Soviet Union collapsed, Russia and the United States cooperated in securing the return to Russia of nuclear weapons that had been deployed in Belarus, Kazakhstan, and Ukraine.

In contrast to this, the acquisition of nuclear weapons by India and Pakistan has weakened the non-proliferation regime. If North Korea proceeds to develop and deploy a substantial nuclear weapons arsenal, this will push even an anti-nuclear Japan to give serious thought to becoming a nuclear weapon state. Responsible and law-abiding governments like those of South Korea and Taiwan may have to follow suit. An Asian nuclear arms race could ensue.

The restraint regime eventually constructed by the nuclear superpowers during the Cold War is not necessarily going to be replicated in this phase of the nuclear era.

The most important achievement of Moscow and Washington was to establish a norm: nuclear weapons were not to be used. At no time did the two governments sign a treaty or issue a statement saying this. Their strategic doctrines rested on the proposition that nuclear weapons could be used. From time to time, dangerous forms of nuclear diplomacy were employed by the two countries, in particular by Soviet General Secretary Nikita Khrushchev and U.S. President Richard Nixon. But to this day, nuclear weapons were never used. Nearly sixty years of non-use certainly established a precedent. Nuclear weapons, as NATO's official doctrine has proclaimed, have become weapons of last resort. This precedent—without a doubt the most important precedent of the Cold War—is now in some danger. It is jeopardized by the possible acquisition of nuclear weapons by terrorist organizations and the spread of nuclear weapons to countries that occasionally engage in hot wars with one another. The prospects of more nuclear weapon states around the rim of Asia, heightened tensions in Northeast Asia and South Asia, and continuing hostilities in the Middle East pose urgent threats to international peace and security.

U.S. Policies

The established norm of non-use of nuclear weapons also has been challenged by recent policy statements by the Bush administration concerning the roles and missions of U.S. nuclear forces. The assertion has been made that a

nuclear response to the use of biological weapons in combat would be appropriate. There is also a tendency in U.S. official circles to consider the use of low-yield nuclear weapons against deep underground hardened bunkers a reasonable option in a limited war. And deterrence is considered to be enhanced on the grounds that use of such low-yield nuclear weapons would be approved by U.S. national command authorities, or at least potential adversaries might believe that to be so. Such a policy would be in direct conflict with the tacit understanding that gradually emerged as the world moved through the first fifty-eight years of the nuclear age: the only rational purpose for nuclear weapons is to deter the use of nuclear weapons by an opponent and to respond in kind if attacked with nuclear weapons.

Deterrence emerged as the key concept of the nuclear age when the terrifying consequences of nuclear war became generally known and were confronted by the human conscience for the first time. Nuclear bombs were not just one more weapon. With an energy release a million times larger than that of weapons previously known to mankind, mass destruction is inevitable. No protection is possible. These weapons present humanity with a fundamental issue: can civilization survive? “We are rapidly getting to the point that no war can be won,” said President Dwight Eisenhower in 1956. Conventional wars can be fought to exhaustion and surrender, but nuclear war can come close to “destruction of the enemy *and* suicide.” Ronald Reagan understood this in his bones and, while in office, often said, “A nuclear war cannot be won and must never be fought.” These facts make it imperative for the United States to reaffirm that the singular purpose of its

nuclear weapons is to avoid their use, not only by others against the United States and its allies but also by the United States against anyone else. The United States must prepare to meet its vital interests in the world by developing and training twenty-first century conventional forces against emerging threats, while pursuing diplomacy to discourage, if not prevent, the development of threats posed by nuclear weapons.

The United States should leave no doubt about its intentions to take action preemptively if it perceives an imminent threat of the use of biological or chemical weapons, and to respond forcefully against any actual use of biological or chemical weapons in combat. The threat to try commanders for war crimes if Iraq used any of these weapons was entirely correct and a deterrent in itself. At the same time, the technical realities of nuclear weapons and their effects must be recognized and their value in confronting biological and chemical weapons or hardened deeply buried targets should not be exaggerated. This point will be discussed more fully later but these technical factors are relevant:

- It is impossible to destroy hardened underground bunkers or military targets with a nuclear bomb without generating a substantial cloud of deadly radioactivity.
- The effective range of nuclear weapons in neutralizing the deadly effects of biological pathogens and chemical gases is severely limited by the fact that the blast effects of nuclear weapons extend beyond the range of the high temperatures and radiation they create when detonated underground, and that are required for destroying such agents.

- A great payoff in the ability of military systems to destroy hardened underground targets can be gained from improvements in intelligence that make it possible to locate, identify, and characterize such targets with accuracy, and to define and identify their vulnerable points such as tunnel entrances or air ducts.
- Additional gains could be achieved by improving the ability of weapons with hardened reentry bodies and armed with conventional explosives to penetrate into the earth to depths of several tens of feet or more before detonating, thereby delivering a significantly larger shock onto the target than if they were detonated at or near the surface.

If the United States, the strongest nation in the world, concludes that it cannot protect its vital interests without relying on nuclear weapons in limited war situations, whether against biological weapons or deeply buried targets, it would be a clear signal to other nations that nuclear weapons are necessary for their security purposes. That inevitably would dash any hope of reducing nuclear danger by strengthening a non-proliferation regime. Diplomatic operations, in the context of a policy of defensive last resort for nuclear weapons, offer the best hope for preserving and strengthening a non-proliferation regime in the years ahead.

Emerging U.S.-Russian Relations

The collapse of the Soviet Union, the end of the Cold War, and the transformation of the United States–Soviet/Russian relationship have radically changed the way in which

the nuclear threat is perceived by the two nations, and by others. In some ways the danger appears to have receded: deep crises in the American-Russian relationship are not likely to occur. In the past, it was not implausible to think that a U.S.-Soviet nuclear war might be triggered by tensions over access to Berlin, conflicts in the Middle East, or Soviet deployment of missiles in Cuba. Operations of nuclear-equipped sea and air units of the two sides, especially in times of tension, generated additional worries about the adversary's intentions. The deployment of new strategic weapons systems, indeed almost any action that seemed to threaten the military balance, injected fresh concerns into the already troubled relationship. All that is gone, probably forever.

But the perception, both in America and in Russia, that the other is not fully to be trusted in the life-or-death matter of nuclear weaponry has not completely disappeared. Thus, the United States deems it necessary to hold in reserve thousands of warheads as a hedge against a renewal of hostility between the two countries. Russia does not fully trust U.S. assurances that the American ballistic missile defense system is not directed at gaining a decisive advantage in the nuclear relationship. It is a further cause for serious concern that both nations have kept their nuclear forces on high alert, ready to launch on very short notice. The existence of the other's nuclear-armed ballistic missiles is the only conceivable threat that would justify this. And so neither Russia nor the United States really has moved beyond a peace that is conditional.

The nuclear danger posed by this state of affairs is latent, hardly noticed on a day-to-day basis except by those manning the nuclear ramparts on each side, but it

limits what the two nations can do together. The legacy of the Cold War still shadows the relationship.

This legacy is felt in other, more direct ways as well. The Ministry of Atomic Energy (MINATOM) was a state within the state during Soviet times. Whole cities were part of its domain and a sizable portion of the Soviet work force was employed in one way or another by the Ministry. MINATOM is still a force to be reckoned with in the new Russia. Its potential as a hard currency earner gives it a certain independence, even in foreign affairs. Its dealings with Iran, for example, have been a major source of irritation between Washington and Moscow. U.S.-Russian collaboration in nuclear non-proliferation has been hampered by MINATOM's determination to sustain its industrial and technological base through contacts and contracts with other countries that are, at best, questionable in terms of blocking the spread of nuclear weapons to additional nations. The new relationship between Russia and the United States should permit a greater common understanding between the two countries regarding permissible exports under Article IV of the nuclear Non-Proliferation Treaty. This has not yet been achieved; the problem deserves a higher priority.

Another legacy of the Cold War is the large quantity of nuclear materials and nuclear warheads stored in less than ideal security circumstances. With the lifting of the oppressive measures that regulated travel and other aspects of life in the Soviet Union, and the deterioration of Russian security services, there came a need for new systems of protecting and accounting for nuclear materials. Substantial progress has been made in installing new systems, but vulnerabilities remain. A market exists for

nuclear weapons–usable materials which Russia may inadvertently supply unless these vulnerabilities are eliminated.

An example of successful U.S. statecraft deployed to deal with this problem is the Nunn-Lugar Cooperative Threat Reduction program. Funded by the United States Congress since 1992, the program provides, *inter alia*, for material protection, control, and accountability (MPC&A) of the special nuclear material (plutonium 239, and enriched uranium) in the former Soviet Union. The largest stockpiles of the world's nuclear weapons and fuel reside there. As reported in 2002 by the Harvard University Project on Managing the Atom (Matthew Bunn, John P. Holdren, and Anthony Weir, 2002), Russia still has some 160 tons of separated plutonium and 1,100 tons of highly enriched uranium, enough fuel for more than 50,000 nuclear warheads, in addition to its approximately 20,000 warheads that already exist. Material is reportedly spread across more than 250 buildings at 50 sites. Warheads are located in more than 60 sites, in more than 160 storage bunkers. This constitutes a very rich treasure for would-be proliferators or terrorists, emphasizing the importance of cooperative measures to secure them from theft or sale.

This situation speaks to the continuing need for U.S.-Russian cooperation to tame the nuclear danger that hangs over the world:

- First, the two nations need to work at escaping from the mutual nuclear deterrence trap that still continues to ensnare them; their relations should become more like those that the United States has with Britain and France.

- Second, the two nations need to work more closely together in denying potential proliferant countries access to nuclear materials.
- Third, Russia and America need to be especially vigilant regarding the half-century-old de facto prohibition on the use of nuclear weapons in war.

A Nuclear Nightmare

Although vitally important work remains to be done with Russia, the nuclear threat has changed significantly since the Cold War ended. Several states in regions afflicted by persisting national rivalries and disputes have either acquired nuclear weapons or are building the basis for acquiring nuclear weapons in the future. India and Pakistan have a territorial dispute that is at the top of each country's agenda, and each has now acquired nuclear weapons. This has not calmed the situation. Indeed, it can be argued that, with both nations now having nuclear capabilities, Pakistan was enabled to conduct a war of infiltration against India and to support terrorist activities in Kashmir without fear of a major Indian military response, precisely because both nations possess nuclear weapons. If non-nuclear-use guidelines exist at all in the subcontinent, there is no reason to think that they will be long lasting. The comparison of India and Pakistan today to the United States and the Soviet Union during the Cold War is not valid: the two superpowers were not neighbors and had no territorial disputes; their armed conflicts were never with each other. A large-scale Indian invasion of Pakistan in the name of cauterizing the bleeding wound of Kashmir would test a non-nuclear-use rule to the

utmost. And neither side thinks that that scenario is out of the question. Furthermore, it seems clear that New Delhi and Islamabad are each aiming some of their public policy statements at Washington, in an effort to get the United States to pressure the other side. The presence of the United States as a third party introduces a complexity not seen in the U.S.–Soviet Union confrontation and adds another layer of unpredictability. It also puts a heavy burden on the United States to judge the situation correctly.

Iran may have no present intentions to build nuclear weapons, as it claims, but it is certainly putting itself in a position to build them in the future. Seeing itself as a potential victim of several hostile nations, the United States included, Iran probably conceives of nuclear weapons as a deterrent and as a means of gaining regional prestige and strategic leverage. Saddam Hussein's nuclear weapons program must have influenced thinking in Tehran. Conversely, whatever the rationale, an Iranian atomic bomb would have some effect on future Iraqi defense planning, no matter who controls that nation in the years to come. Israel would be bound to view a nuclear-armed Iran as yet another serious threat to its survival.

North Korea's acquisition of a declared and increasingly robust nuclear weapons stockpile would make it all but certain that Japan and South Korea also would build nuclear weapons. Taiwan might not be far behind, a possibility that probably would bring a preemptive attack by China to the forefront of international concerns. Very likely the prospect of such destabilizing developments is stimulating efforts by the Chinese to stop the North Korean program.

These developments all around the rim of Asia are

setting the stage for the next chapter in the history of the nuclear age. The plot of this story is shaping up already:

- The era of managed nuclear weapons competition, essentially by two nations, is over;
- the predictability that Moscow and Washington tried, with some success, to build into the system will give way to increasing uncertainty and worst-case assumptions;
- proliferation of nuclear weapons capabilities will proceed at a near-geometrical rate as new nuclear weapon states over time beget more than one imitator;
- the stability fostered by a long period of non-proliferation will break down as political and other restraints prove unable to stem the tide;
- this will generate increased pressures on many countries in unstable regions to make biological weapons to offset growing nuclear capabilities around them;
- transnational terrorist organizations will have an easier time gaining access to nuclear weapons owing to loss of control over these weapons by unstable governments, or even by deliberate transfer of the weapons;
- this cascade of easily foreseeable events will lead, sooner or later, to the use of nuclear weapons in combat by nation-states, or to attacks on major population centers by terrorists equipped with nuclear weapons;
- the taboo against the use of nuclear weapons will erode to the point where preventive war will seem to be the safest course for those nations capable of it.

Containment and Deterrence

This nightmare scenario is itself based on worst-case assumptions, it may be argued: will not the deterrent effect of nuclear weapons demonstrated in the U.S.-Soviet competition be the overwhelming consequence of nuclear proliferation, as Kenneth Waltz maintains in his book, *The Spread of Nuclear Weapons: A Debate Renewed*, with Scott D. Sagan (W. W. Norton, 2003); why should control of these weapons not be as effective as it has been in the past?

Scott Sagan, in the same book, has described, in convincing detail, a number of frightening incidents involving U.S. nuclear weapons resulting from the failure of command and control and from flaws in the management of nuclear weapons—incidents that occurred even though those in charge of nuclear weapons paid a great deal of attention to safety and security. He suggests that expectations of an impeccable performance by newly minted nuclear powers are misplaced.

The main interest of both the Soviet Union and the United States during the Cold War was in maintaining the status quo in Europe. Europe was the only place where an all-out nuclear conflict between them would have been almost automatic if a war had broken out, certainly in the early stages of the Cold War. Cuba and the Middle East generated nuclear crises that resulted from mistakes or miscalculations but these were contained. A similar mistake in Berlin would have been catastrophic. With the consolidation of clear-cut spheres of interest in Europe, and a growing recognition, in both Moscow and Washington, of war's calamitous consequences, the likelihood of

nuclear war had dropped, almost to the vanishing point, by the time the Cold War ended. Both sides were satisfied with the status quo. But the status quo is not an objective that is commonly accepted in regions where future arms races may occur—not in the Middle East, not in South Asia, and not in East Asia. The calming effect of being satisfied with things as they are will not be there to restrain the prime antagonists.

Despite this, containment and deterrence will have their role to play in relations between nation-states for a very long time to come, although of course there are limits beyond which the behavior of governments of any stripe cannot be influenced. To act in a manner that suggests those two concepts have lost their value in inter-state relations would be to cast aside two extremely useful tools of foreign policy. The consequences could be extremely damaging—for the United States and for others.

Deterrence presupposes that the threat of certain destruction of an enemy will induce prudence in that nation's policies. In the absence of that expectation and that effect, inter-state relations would truly become, in the words of Thomas Hobbes, "a war of all against all." Much of the fabric of international cooperation has been stitched together by attempts to make the world safe for deterrence, in the belief that living in the nuclear age implies a willingness to think of force as a last resort and that rules should be constructed to encourage that outcome. Terrorists have tried to change that rule by challenging Churchill's views about the effect of nuclear deterrence: "By a sublime irony of fate, safety will be the sturdy child of terror, and survival the twin brother of annihilation." Churchill was thinking of the impending struggle between

the West and the Soviet Union, and that time is past. But modern weapons of any type should exert a powerful effect on rational decision-makers when they consider war or peace issues.

The terrorists have almost succeeded in convincing some people that deterrence will not work, even against nation-states, and that preventive war is the only meaningful strategy to employ in this era. If they succeed in this attempt to turn government against government they will have achieved their goal of returning the world to the dark ages. The primary goal for all democracies that are the targets of terrorism should be to join forces against the terrorist organizations themselves. Preventive war against sovereign states suspected of harboring terrorists may occasionally be necessary, but Secretary-General Kofi Annan is certainly right to call for unity among the great powers in waging such wars.

It has been argued "Why worry?" The results of proliferation might not be so bad, even if nuclear weapons are developed and used, because the perpetrator can be destroyed by the overwhelming nuclear power of the United States. This argument was made by some who supported war in Iraq and who, at the same time, favored "living with" a nuclear-armed North Korea. They agreed that the spread of nuclear weapons is dangerous, but argued that the dangers, though real, could be managed. Scholars and analysts also have argued the general case that the United States can live comfortably with the spread of nuclear weapons, confident in the knowledge that rational leaders will understand the risks they face if they even think about unleashing nuclear war, and that this will make the world safer because regional rivals armed

with nuclear weapons will be reluctant to go to war with each other.

Deterrence may indeed work in such circumstances, but new nuclear weapons in more hands increase the possibility that, at some point, deterrence will fail. As time goes by, the United States should not assume that its remoteness from unstable areas in Eurasia will save it from the millions of casualties that a single nuclear explosion could cause. The technology of long-distance delivery of nuclear weapons already is quite widespread, and U.S. borders are still porous. As we argue in this book, success in preventing the proliferation of nuclear weapons while building the future global security environment offers the best hope of avoiding the nuclear nightmares portrayed above.