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THE DILEMMA OF NUCLEAR WEAPONS IN THE TWENTY-FIRST CENTURY

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For over thirty years the United States, Russia, and others have been attempting to limit, control, and reduce the nuclear weapons in the world. These efforts have resulted in a number of bilateral and multilateral treaties, and the number of these weapons has been reduced markedly. As a result, we tend to believe we are making good progress. That is the case relative to where we were. In the absolute, however, we are doing very poorly. There are still more than thirty thousand nuclear weapons in the world; we have just seen proliferation of these weapons to India and Pakistan; the risks of even further proliferation seem high; and the nuclear treaty process is in limbo. Without both a new sense of urgency and a more imaginative approach to controlling nuclear weapons, we risk letting the world become one of proliferation to irresponsible nations and groups that could easily be tempted to employ those weapons in anger for the first time since 1945. If the two nuclear superpowers continue to need tens of thousands of nuclear warheads, as both profess to, other nations of the world will say they need them as well.

The genesis of the problem can be summarized in the numbers of U.S. nuclear weapons on three particular dates. Immediately after the attack on Nagasaki on 9 August 1945, the United States possessed no nuclear weapons; it had at that point expended the only two it had built. The nation did not know quite what to do about that situation; it even proposed to the United Nations that a way be found to prohibit the new weapons. Joseph Stalin would not even consider the idea; in 1949—by which time the United States had about two hundred nuclear weapons—the first Soviet test detonation was conducted. That began a race, a spiral that produced a peak on the American side in 1969, at some 32,500 nuclear warheads.

That had to have been an irrational process. How could Americans possibly have thought they could use 32,500 nuclear warheads? After all, there were less than two hundred cities with populations of more than a hundred thousand in the Soviet Union.

But to put the enormity of these weapons into even sharper perspective: all Americans had seen post-attack pictures of Hiroshima; they knew that some 140,000 people had died there. The twelve-kiloton Hiroshima weapon had had a blast effect alone equivalent to some twenty-five million pounds of TNT—that’s *million*. It also had, of course, other effects—radiation, heat intense enough to cause fires, and electromagnetic pulse. Further, a nuclear attack on a city causes severe societal disruption: communications that had passed through Hiroshima no longer did, affecting many other cities; products from Hiroshima’s factories never went anywhere, affecting other factories around the country.

However, the matter needs to be put in context; not all the nuclear weapons that the United States has built since then have been the size of the Hiroshima bomb (see table 1). The smallest type was an artillery shell, but even that was a hundred times as powerful in blast effect as a modern large (two-thousand-pound)

TABLE 1
LETHALITY INDICATORS FOR NUCLEAR WEAPONS

Warhead (kilotons)	Use	TNT Equivalent (pounds)	Comparison to 2000-lb Bomb
0.1	artillery	200,000	100X
5	Senate proposal	10,000,000	5,000X
12	<i>Hiroshima</i>	25,000,000	12,500X
250	U.S. ICBM	500 million	250,000X
550	Soviet ICBM	1.2 billion	605,000X

Plus: radiation, heat/fires, EMP, societal disruption

conventional bomb. Recently the Senate Armed Services Committee talked of developing a rather small nuclear device that might be useable in circumstances in which the nation would not think of using a huge weapon; the smallest one it considered would have five thousand times the blast effect of a two-thousand-pound bomb. Today, the standard weapon in the U.S. arsenal that could quickly be aimed at Russia (both sides having “detargeted” their ballistic missiles in January 1994) is 250,000 times as powerful as a two-thousand-pound bomb. The standard Russian weapon is the equivalent of over a billion pounds of TNT—over six hundred thousand times the power of a two-thousand-pound bomb.

CONVENTIONAL THEOREMS, SPECIOUS REASONING

How in the world did this nation ever get to 32,500? The primary reason is that the United States has always treated nuclear weapons as though they were simply larger conventional weapons. More specifically, the basic mistake was to apply

certain theorems of conventional warfare to nuclear warfare, producing four misleading concepts:

- The importance of a rough parity in numbers of weapons
- The possibility of deterring an opponent from initiating nuclear war by threatening some specific set of targets
- A “window of vulnerability” for both sides
- The stated willingness, even today, of the United States to initiate nuclear war.

Numbers

In conventional warfare, numbers are important. No one wants to have fewer tanks, infantry, or airplanes than an opponent—a valid enough proposition. In nuclear warfare, however, where weapons have blast effects equivalent to hundreds of millions of pounds of TNT, it ought to be obvious that the point of diminishing returns sets in quickly.

The author once had the opportunity to ask Robert McNamara, who was secretary of defense from 1961 to 1968, how the United States accumulated over thirty-two thousand nuclear weapons. The U.S. government, he explained, would periodically receive intelligence reports that the Soviets were starting new nuclear-weapons programs, apparently with the aim of either catching up with or exceeding the American arsenal; each time, the United States would build new systems of its own to counter them. The Soviets, in turn, would learn that the Americans were building new weapons; they would start new programs to counter *them*—and on we went, spiraling upward.

Target Sets

McNamara tried to arrest this spiral by limiting the strategic arsenal to the size necessary to destroy a given percentage of the Soviet industrial capacity and population in order to deter the Soviet Union from starting a nuclear war. The percentages he chose were indicative of how far astray strategic thinking had gone; they were absolutely enormous, something like 40 percent of the Soviet Union’s industrial capacity and 25 percent of its population, between six and seven thousand targets in all. It boggles the imagination to think that in the 1960s the United States believed that it needed a destructive capacity of such size to deter the Soviet Union. Both nations had bought into a specious reasoning according to which the important thing was parity in numbers of weapons, an assumption resulting in an ultimate inventory between them of some seventy thousand nuclear weapons.

Even so, by 1969 it was obvious that something was badly wrong. American political leaders were loath simply to reduce numbers of U.S. nuclear weapons,

probably for fear of appearing weak vis-à-vis the Soviet Union. Instead, by the 1970s, they had started the nation on a path of nuclear arms control agreements.

How could Americans possibly have thought they could use 32,500 nuclear warheads?

At the same time, U.S. strategic planners began to shift away from industrial capacity and population to military targets, selecting

those they thought vital to deterrence and assigning forces to attack them in what was known as the Single Integrated Operational Plan, or SIOP.

My first encounter with the enormity of all of this came in the early 1970s, as commander of a carrier task group in the Mediterranean. I had had no experience whatsoever with strategic nuclear matters, but I now had command of a force that possessed strategic nuclear weapons. I sent for a pilot of an A-6 Intruder, the primary U.S. carrier-based attack aircraft of the time, and his bombardier/navigator. “Bring me,” I told them, “your target folder and tell me what you do if I’m ordered to order you to release your nuclear weapon in accordance with the SIOP.” The two young men came into my cabin, opened their target folder, and said, “Here is our target, Admiral.” I noticed first of all that it was in Bulgaria. *Bulgaria?* I couldn’t say so to these people who might have to risk their lives to carry out this plan, but in a major nuclear war, with thousands of warheads going off all around the world, why were we going to worry about Bulgaria?

The target was a railroad bridge across a river. The folder had a photograph of it, but all I could see was railroad tracks coming down to the north side of the river, and more tracks going away from the south side. “Unfortunately, Admiral,” the bombardier explained, “the bridge is too small to be seen in this photo.” I came away with the conviction that if we had sufficient nuclear weapons to hit an invisible bridge in Bulgaria, we were overstocked. Yet today the United States still has six thousand nuclear warheads aimed at Russia. The Joint Chiefs of Staff say two thousand is about as low as they can go. These are such enormous weapons that it is amazing people still think in such terms.

Deterrence

How should we calculate what it takes to deter? First of all, deterrence is in the eyes of beholders—what they *think* is going to happen. If they are dealing with the very survival of their societies, they have to assume the worst. The worst would be the other side hitting cities, destroying the society and its population. In that case, it makes no difference what is put in the target set. Strategic planners theorize, even agonize, over targeting, but it does not matter: the other side necessarily assumes that its cities will be targeted.

The question, then, is, how many Russian cities does the United States have to threaten in order to deter the Russians? To make a rough calculation, let us put the question the other way around: how many cities in the United States does

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Russia have to threaten to deter us? Imagine the president of the United States appearing on television to tell the American people, “There is no longer a threat of

major nuclear war. I have knocked out the entire Russian nuclear capability—and all I lost was New York City and two hundred thousand people.” If there was ever a time when Americans might have thought that would be a suitable exchange, would they today, with Russia in the straits in which it now finds itself, politically, economically, and militarily? No. The United States is deterred by the prospect of even a *single* nuclear detonation on its soil.

Yet our nation has continued with this specious line of reasoning—that it must be able to destroy some given (large) number of targets. Does it really take six thousand warheads, or even two thousand, to deter Russia? No. It probably takes the same number as it does to deter the United States—one. But let us play it safe. Call it five or ten, or some such number—still, it will not be in the hundreds or thousands. The point is to make Russian “beholders” feel certain that if they start a nuclear war with the United States they will suffer five or ten nuclear detonations on their cities in return.

To “size” a nuclear arsenal, though, one also has to ask how large a force would be needed if one ever had to retaliate. It is difficult even to imagine what would happen—if a nuclear war begins, everyone has already lost. It will not make any difference whether we ultimately do more damage to our opponent, the aggressor, than has been done to us; the damage to our own country will have been so great that we will have lost, too.

Still, we can bound the problem, at least on the upper side. A group at the Massachusetts Institute of Technology did a study in 1987 hypothesizing 239 Soviet nuclear detonations on the liquid-energy supplies of this country—the port terminals, oil storage facilities, pipelines, and so forth. It found that two years later, 60 percent of the U.S. population would have died of starvation, because food could not be shipped. At the end of six years, gross domestic product would have been only 40 percent of what it had been before the war. Roughly two hundred warheads, then, is probably more than enough retaliation to set any society back to what we may call its point of nonrecovery, at which it can never again be what it had been.

Windows of Vulnerability

The idea of possessing only two hundred warheads, however, is very difficult to sell; many strategic planners have strong objections. The first is the familiar idea of the “window of vulnerability”—that a first strike by either side could totally disable the nuclear capability of the other side. This has always been a canard. For over thirty years, ballistic-missile submarines, SSBNs, capable of launching thousands of nuclear warheads, have been at sea, where they are virtually invulnerable. Even beyond that insurance is the phenomenon that Clausewitz called “friction”—in warfare, nothing ever succeeds completely. Even if there were nothing but land-based intercontinental ballistic missiles (ICBMs), a side that tried to knock them all out would be lucky to destroy 90 percent.

The United States once had a thousand ICBMs; a 90 percent effective strike would still leave a hundred deliverable weapons. An attack that was 99 percent effective—and no one in the military would ever imagine achieving 99 percent success in any kind of an attack—would leave ten ICBMs intact, which with three or more warheads each would be enough to deter, if we accept that deterrence at low numbers is valid.

First Use

There is still another objection to the United States limiting itself to very low numbers of nuclear weapons—that it may *want* nuclear weapons with which to initiate nuclear war. In 1952, the United States declared that it would employ nuclear weapons to defend its Western European allies against a conventional attack, if necessary. This was called “extended deterrence.” It was never a military strategy but a budgetary one: it was a way to excuse the Europeans from building large enough conventional forces to defend themselves. The Western Europeans did not want a nuclear war on their rather limited geography, so they spoke of an “umbrella,” a nuclear umbrella, over it. By this they meant that if the Soviets invaded and conventional fighting in the area protected by the umbrella went badly, the United States would launch nuclear weapons—its own weapons, firing them over that umbrella, against the Soviet Union. Thus all the nuclear devastation would be in the United States or the USSR, outside the umbrella. The Americans looked at it rather differently. “If the war goes badly inside this umbrella,” an American would have said, “and if the Europeans want us to, we’ll launch tactical nuclear weapons from Western Europe to Eastern Europe. Of course, there may be retaliation, but all the nuclear devastation will be inside Europe, inside the umbrella.”

Today, fortunately, defending Western Europe is no longer a problem. Accordingly, U.S. strategic planners have conjured up new contingencies in which the United States might wish to initiate nuclear war:

- To preclude the revival of a Soviet-type threat to Europe
- To respond to the use of biological weapons against U.S. forces
- To destroy underground headquarters, weapons, or weapon storage
- To repel a cross-Straits invasion of Taiwan by a force of massed Chinese junks
- To repel a massive Chinese ground attack on South Korea
- To respond to, and thus deter, any sort of heinous act against the United States.

There is no question that in every one of these instances—one might think of others—a nuclear response would be more efficacious militarily than a conventional one. But to consult Clausewitz again, war must have a political objective, and it must not be waged in a way that defeats its political objective. This is hard for people of the World War II generation to accept, having been raised in an era of unconditional surrender. And subsequently we learned the wrong lesson from Vietnam—that the military should never again let politicians pick targets, as Lyndon Johnson did in that war. But who picked the targets in Kosovo in 1999? The political implications of targeting in Kosovo were so clear that any military objections were very muted.

How is it, then, that planners today argue that the United States might use nuclear weapons in these six cases simply because they would be more effective militarily? This is sloppy thinking—it overlooks the fact that political objections will prevail. First, in all these instances (with the possible exception of contagious biological weapons), a nuclear response would be considered disproportionate. Second, it has been over a half-century since nuclear weapons were used; the uncertainties involved in unleashing them again would seem too great. Third, it is not melodramatic to point out that at the extreme, the survival of humankind would be at risk. That a president of the United States would take the moral responsibility of opening this Pandora's box, not knowing where events could lead, is beyond belief. Finally, and fortunately, alternatives are becoming available—in the form of precision guided munitions (PGMs), as well as such devices as remote-targeting systems that make PGMs easier to use.

If planners insist that the nation might willingly use nuclear weapons in scenarios like those above, precision conventional capabilities specifically tailored to deal with them will not be developed. Take the cross-Straits invasion of Taiwan, for instance; to land a force of the size that would be needed, the People's Republic of China might have to send waves of wooden-hulled junks. It is very difficult to sink a junk; to stop such an invasion, a specialized munition that would go through a wooden hull and kill everyone inside would be very handy.

But such a thing cannot be conjured up at the last minute. It has to be thought about in advance, beginning with the understanding that the incremental military advantage of using nuclear over precision guided weapons in such a case would not be worth the political cost.

GETTING TO TWO HUNDRED: STRATEGIC ESCROW

The United States, then, does not need a reserve of nuclear weapons to take the offensive; and something in the neighborhood of two hundred nuclear warheads will do for deterrence and retaliation. How would we safely get down to a nuclear arsenal of something like two hundred warheads? Today, the most imaginative approach is to finish the second Strategic Arms Reduction Treaty (START II), which takes each side down to 3,500 nuclear warheads (see table 2), and then perhaps negotiate another agreement that will reduce warheads to two thousand, or lower.

There are problems here. START II is stymied. The Russian Duma has passed and ratified it, but with caveats concerning American national-missile-defense

TABLE 2
U.S. NUCLEAR WEAPONS

Date	Number	Remark
16 August 1945	0	Two expended
1949	c. 200	First Soviet test
1969	32,500	Peak
1989	6,000	START I target
1993	3,500	START II target
2000	2,000	JCS minimum/START III

developments. There is not much chance that the U.S. Senate (which ratified the treaty in an earlier form in 1996) will accede to such reservations. Even if ratified in the same form by all parties, START II is too slow; if it went into effect today, the reduction to 3,500 would be completed only in 2007.

Too much can happen between now and then, as the Russian scene changes, and as the Iraqs, Irans, and North Koreas of the world aspire to nuclear capabilities.

In any case, the 3,500 figure, which is so often invoked, is phony. The treaty covers only nuclear warheads actually mounted on delivery vehicles. The United States has said that in addition to the 3,500 permitted by the treaty it would also keep 3,500 spares, which of course could be mounted on multiple-warhead vehicles, and it has indicated that it will keep 3,000 *tactical* weapons, which are not covered by the treaty at all. That makes a total of 10,000. Proportionally, if a START III treaty reduced “covered” U.S. warheads to two thousand, the nation would in fact possess five thousand. These reductions, whatever numbers we choose, do nothing significant to reduce the threat to this country. If five hundred nuclear weapons were launched against us, we would be just as dead as if two or three thousand had been.

What can be done that would be more effective? One approach is called “strategic escrow.” The president would begin by directing the U.S. Strategic Command to take a thousand warheads off its ICBMs and put them in storage not less than three hundred miles away. The president would invite the Russians to send observers—not controllers—to count what goes into storage and remain to see what goes out. Ideally, the Russians would reciprocate; in fact, they would

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have to. Most reports—including from Russian sources, borne out by a statement by President Vladimir Putin—indicate that the Russians today are nearly down to a

thousand usable intercontinental nuclear warheads. This is because since the collapse of the Soviet Union they have not been refurbishing and replacing them. It is in our interest in fact to get the size of the U.S. arsenal down to that of the Russians because a growing disparity in numbers of usable warheads could make the Russians feel so insecure that they might place their remaining nuclear weapons on hair-trigger alert. Given American initiatives and Russian reciprocation in a program of strategic escrow, in a matter of four to five years both sides could be down to something like a thousand deliverable, ready warheads.

At that point, an arrangement would have to be negotiated with the other six nuclear powers to create a “condominium” by which each of the eight states would ultimately keep no more than two hundred warheads, *all of them in escrow*—none of them ready to fire, all of them subject to international verification. Further, they would agree to work together to prevent the proliferation of these weapons to other nations, including sharing intelligence information. Under the condominium regime, there would be no nuclear weapons in the world immediately ready to fire. The international observers at the storage sites would warn if any one of the eight nuclear powers prepared weapons for use. At the same time, any of the eight could bring weapons into readiness as a threat against any other nation that acquired a nuclear capability and began threatening others with it.

The nuclear nations would move into this condominium state in a gradual way, undergoing quite intrusive United Nations inspections. These nations would not need to expose themselves to a surprise, disabling attack, even if some other nation sequestered a few hundred warheads during a transitional period. But then, squirreling away, say, two hundred nuclear warheads ready for use is not a simple proposition; it means somehow hiding the same number of ICBMs or other delivery vehicles, in addition to warheads. A nation considering doing so would still face friction; even a two-to-one advantage does not guarantee total protection.

This process could produce a very stable world. If a Saddam Hussein acquired a nuclear warhead and started threatening to use it, the nuclear nations would simply bring warheads back from escrow. By acceding to the condominium the nuclear powers would be telling each other, and the world, that though they were not agreeing to abolish nuclear weapons, because it is impractical at this point (though a condominium would be an achievable milestone on the path to that desirable goal), they were accepting zero reliance on these weapons, zero readiness for their immediate use, and zero chance of delivering a surprise attack. A condominium will not lessen the lust of rogue leaders for nuclear weapons, but it should temper the willingness of others to aid and abet their attempts to obtain them. For instance, such a dramatic move on the part of the United States and Russia would pressure third parties to put their economic interests after global security as well, by not selling materials of use in a nuclear program to rogue states. Presently, our country, with its hoard of excess weapons, does not appear serious about preventing proliferation and therefore does not get the cooperation we need.

Of course, a Saddam Hussein may still use a weapon if he has one, but he will have to take into account the hundreds of weapons poised out of his reach, able to eliminate his country if their owners so decided. That is not a guarantee that he will not deliver a nuclear attack, but it is as good as probably can be done.

If there is a reasonable alternative to a strategic escrow/condominium arrangement, it certainly is not traditional arms-limitation agreements. The START treaties are moribund; the United States has antagonized not only Russia and China but a number of its allies, and it has no national missile defense program; the United States has also expressly rejected the Comprehensive Test Ban Treaty. These actions have killed the momentum of nuclear arms control and brought U.S. leadership in this area into serious question.

A VERY DIFFERENT WORLD

There is an urgent need to move away from where we are. Why? We see a number of ominous signs. Plainly, no one can tell where Russia will be in five or ten years. So far, apparently no Russian weapons or fissile materials have leaked out, but observers are worried; there could be much greater cause for worry if conditions deteriorate further in Russia. In South Asia there is an unprecedented inflammatory situation—two nuclear powers, Pakistan and India, who from time to time go to war with each other. As for the Middle East, since December 1998 there have been no UN inspectors in Iraq. When inspectors first went there in 1991, they estimated that Iraq was only months away from a nuclear capability. How far away can Iraq be now? Finally, there is evidence that Iran and North Korea have been moving toward nuclear weapons as well.

What these developments portend is a world in which nuclear weapons proliferate into the hands of someone who will actually use them. Given Iraq's intense rivalry with Iran and animosity to Israel, proliferation to Saddam Hussein would mean the possibility of at least occasional use of nuclear weapons. This would produce a very different world than the one we now live in. The attack might not be on the United States, but it would change all the relationships between humans and between nations: all dealings between them would be clouded by the risk that a breakdown in relations could lead to nuclear devastation.

The world badly needs some imaginative approach like a condominium of the nuclear powers under strategic escrow. It will not get one without rejecting the propositions of conventional warfare that in decades past were transposed into the nuclear era. In short, it is mandatory that the specious reasoning that has underlain nuclear policies for over fifty years be corrected. The United States must lead the world in this direction to forestall an era of occasional use of nuclear weapons. After all, it was the United States that introduced these weapons. Beyond that, it is the only nation today with the stature, power, and wisdom to manage a new nuclear-weapons regime.

One hopes that at war colleges today professors are teaching, and students are learning, not simply contemporary facts but how to reason and analyze through problems like this one better than the generations before have done. The United States must deal with the nuclear problem in a much more rational way than it has. If it is to do that, military officers, whether or not their duties take them into this arcane field directly, must keep intellectually involved in this issue; the collective impact of their thinking, speaking, and opinions will have an effect in the future. The nation needs to be brought to understand that nuclear weapons are generically different from conventional weapons. They are too powerful to be used for anything but deterrence or—God help us—retaliation.

