

The Prohibition of Nuclear Weapons: An Essential Element of Nonproliferation Policy

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Allen Schick suggested this event after the Federation of American Scientists presented me with their “science in the public service” award on the occasion of Federation’s 60th anniversary. A few years ago the award was renamed in honor of Hans Bethe, a very distinguished physicist who, among many other things, in 1938 first elucidated the sequence of nuclear reactions that power the stars, for which he was awarded the Nobel Prize in physics in 1967.

There is a wonderful story about Hans. The day after he had worked out the reactions, he was walking at night with his then-fiancée (and later wife) Rose. She remarked on how beautiful the stars looked, and Hans said, “Yes, darling, and tonight I’m the only one on Earth who knows how they do it.”

Hans was also the head of the theoretical division of the Manhattan Project. He later took a leading role in the arms control movement during the 1960s and again in the 1980s by arguing against the development of ballistic missile defense, explaining that a defense could be overcome at much lower cost by the offense. This illustrates one of paradoxes of the nuclear age: that developing a defense could, in the end, leave one less secure.

The last recipient of this prize was Philip Morrison, a truly wonderful person who I had the great pleasure of having as an instructor in an undergraduate physics course. Phil probably was best known for his book reviews in *Scientific American*, for his wonderful science education programs on PBS, and for first suggesting SETI, the search for extraterrestrial intelligence, in radio signals.

Phil worked on the Manhattan Project, too. He assembled the bomb that was dropped on Nagasaki, and a few days later surveyed the devastated city. A few months later he helped found FAS, and became an eloquent and impassioned advocate for nuclear arms control.

It goes without saying that I’m incredibly flattered to have had my name mentioned alongside Bethe and Morrison. But two things worry me. First, I worry that you might think that I believe I’m in the same league as these giants. I assure that I know that I’m not.

I had to smile when Henry Kelly, the president of FAS, explained that they decided to give the prize to an “underappreciated person”—someone who has been toiling away in the trenches—in my case, helping to write reports for the National Academy of Sciences, serving on the boards of FAS and other NGOs, and occasionally playing the role of an anonymous adviser in the Departments of Defense, State, and Energy.

In this regard, I’m following in the path of my dissertation advisor, John Holdren—another recipient of the FAS award. He was the first—but not the last—person to remind me that one can accomplish a lot of good if you don’t care who gets the credit for it.

The second thing that worries me is that Hans Bethe and Phil Morrison both died last year. Their deaths came at the ripe old ages of 99 and 89, I’m happy to report, but the trend is worrisome, nevertheless.

The FAS asked me to give a talk on nuclear weapons policy, so I thought I would speak on the same topic today. I have spent my career on things nuclear, much of it thinking about the dangers posed by nuclear weapons, and how to minimize those dangers.

And so, as part of my ongoing campaign to ensure that I will never again be asked to work for the U.S. Department of Defense, I’d like to propose that the prohibition of nuclear weapons should be the centerpiece of our nonproliferation policy—indeed, a key element of our overall foreign and defense policy.

Soon after the end of the Cold War, there was much interest in the idea of prohibiting nuclear weapons. The Canberra Commission was the most prominent. It included Lee Butler, the previous Commander in Chief of the U.S. Strategic Command, and former Secretary of Defense Robert MacNamara, as well as a former French prime minister and a former head of the UK defense forces.

There were also books and reports by Pugwash, the Stimson Center, Jonathan Schell, and others. I served on a National Academy of Sciences committee that included several former commanders of U.S. nuclear forces, as well as several former nuclear weapon designers and Pentagon officials. That committee produced a consensus report that looked favorably on working toward the prohibition of nuclear weapons.

The basic logic was straightforward. During the Cold War, the United States faced an implacable adversary. Were it not for U.S. nuclear weapons, many people believed that the Soviet Union was ready, willing, and able to use the huge armies under its control to subjugate all of Europe and most of Asia.

And so nuclear weapons were at the very center of U.S. security policy—first to deter or defeat conventional attacks against U.S. allies in Europe and Asia, and then, as the Soviet Union developed a nuclear arsenal of its own, to deter nuclear attacks.

The huge armies crumbled with the collapse of the Warsaw Pact and the Soviet Union, and so disappeared the need to deter large-scale conventional war. The only remaining role for nuclear weapons, it seemed, was to deter a nuclear attack by Russia, and perhaps China.

But if we could somehow eliminate Russian and Chinese nuclear weapons, then there would seem to be little need for U.S. weapons. There remained serious questions about the practicality of this goal—in particular, whether we could ever be sure that other countries had eliminated their weapons, and how much it would matter if others cheated.

But the fundamental desirability of the goal seemed compelling, at least from a U.S. perspective. This was summed up well by Les Aspin in 1992, at a commencement address at MIT:

The United States is the biggest conventional power in the world. There is no longer any need for the United States to have nuclear weapons as an equalizer against other powers. If we were offered a magic wand that would wipe out all nuclear weapons and the knowledge of their construction, we'd wave it in a nanosecond. A world without nuclear weapons would not be disadvantageous to the United States. In fact, a world without nuclear weapons would actually be better. Nuclear weapons are still the big equalizer but now the United States is not the equalizer but the equalizee.

Six months later Aspin became Secretary of Defense and commissioned a bottom-up review of U.S. nuclear policy. But the notion that the transformation in world politics called for a correspondingly fundamental transformation in nuclear doctrine never took hold.

I know because I participated in the review. I saw first-hand how hard it is to seriously question policies and plans that have been in place for several decades, and which have been formalized by bureaucratic structures and procedures.

There were reductions in the number of weapons, but the eliminated weapons were either obsolete or redundant or pointless, because their targets had been eliminated in the Warsaw Pact or former Soviet states.

But the basic character of U.S. nuclear posture did not change. The U.S. continued to maintain a large, alert strategic force, targeted for rapid attack against Russian nuclear forces and command and control. This was largely due, I think, to bureaucratic inertia and the persistence of established patterns of thought and behavior.

But in the late 1990s a new pattern of thought started to take hold—one that finds that nuclear weapons are now even *more* useful to the United States than they had been during the Cold War—not as central to U.S. security, perhaps, but essential nevertheless, and useful against a broader range of targets, and against many more countries.

This new pattern fully blossomed after the election of George W. Bush. Leaked portions of the 2001 Nuclear Posture Review, as well as other documents and statements, describe a belief that:

- U.S. nuclear weapons can deter potential adversaries from acquiring chemical, biological, and nuclear weapons and other advanced weaponry;

- That the U.S. should threaten and should plan to use nuclear weapons preemptively to prevent WMD attacks on the United States, its forces abroad, or U.S. allies; and
- That the U.S. should use nuclear weapons to destroy certain high-value targets—in particular, hardened and deeply buried targets, or stocks of chemical and biological weapons—that are difficult to destroy with conventional weapons.

It's fair to say that the authors of this doctrine, if offered Les Aspin's magic wand, would chose not to wave it. They believe that nuclear weapons are valuable for much more than deterring nuclear attack.

This doctrine isn't just words in a high-level report. Leaked and declassified documents indicate that nuclear weapons are surprisingly prominent in the Pentagon's operational plans. CONPLAN 8022 reportedly includes plans for preventive nuclear attacks against North Korea, Iran, and other countries.

When President Bush said, in the State of the Union address, that “we cannot let our enemies strike first,” most Americans were unaware that this included U.S. plans to use nuclear weapons first. If they had been aware, they would disapprove, as opinion polls have consistently shown. At least, there should be a public debate about this. But all relevant documents are secret. Which leads to an interesting observation: if, as is often said, threats of preemptive nuclear use are a deterrent, why keep them secret?

A thorough critique of the Bush nuclear doctrine would take most of the afternoon. Just a few points:

- Many of the countries mentioned by name in the NPR—North Korea, Iran, Syria, and formerly Iraq and Libya—have been trying to acquire WMD in order to deter the United States from invading or otherwise attacking their vital interests. It's absurd to suggest that U.S. nuclear threats will deter these countries from acquiring WMD. Quite the opposite—such threats will spur them on.
- Threats and plans to use nuclear weapons in response to a chemical or a biological attack are at best unnecessary, and at worst counterproductive. Countries already know that the U.S. has nuclear weapons and that, if they hurt us badly enough, they might provoke a nuclear response.

Explicit threats cannot add much to this “existential deterrence.” But they can lead the U.S. into a commitment trap, promising retaliation that might be grossly disproportionate. We shouldn't get into a situation where our reputation depends on carrying out threats that don't make sense. And retaliation would be senseless if we could not determine the true source of the attack. Such threats also violate the negative security assurances the United States has made, and restated repeatedly, not to use nuclear weapons against countries that don't have them.

- Plans for preemptive use of nuclear weapons are even more dangerous. Such plans are often framed as necessary to prevent a devastating attack against the United States, by attacking key WMD targets before they can be used. But when you examine the logic of this argument, the utility of nuclear attacks evaporates.
 - First, U.S. intelligence would have to be virtually certain that an enemy was about to attack the United States. But how would we know this, and how could we convince others, after the fact, that preemption was justified?

Activities that we might interpret as preparing for an attack might only be intended to signal their resolve—for example, to deter a U.S. invasion. A mistaken preemptive nuclear attack would be a tragedy, and unless it was perfectly effective it could trigger attacks against the United States that might have been avoided altogether.

- Second, U.S. intelligence would have to correctly identify the enemy weapons, launchers, and command facilities necessary to carry out the attack. Two wars with Iraq have demonstrated the inability of U.S. intelligence to identify strategically important targets.

Particularly instructive was the opening salvo of the current war, in which the United States dropped four 1-ton bombs on a site that U.S. intelligence believed was a command bunker containing Saddam Hussein. Later inspections revealed that no underground facility existed. Of course, if a nuclear weapon had been used we never would have known what was—or was not—there.

Adversaries can use various deception techniques to hide their weapons and command facilities. They can use mobile facilities or play shell games, moving key functions between ordinary buildings. If we don't know where the targets are, we can't destroy them.

- Third, assuming that we could correctly locate and identify them, the targets would have to be vulnerable to nuclear attack, but not to conventional attacks. The only such class of targets is deep underground facilities. This is the reason that administration proposed to build a new nuclear earth-penetrating warhead.

Even here, conventional attacks on tunnel entrances and other surface features can disable the facilities. And even nuclear weapons can't destroy very deep facilities, which merely encourages countries to dig deeper.

- Finally, the collateral damage that would result from a nuclear attack would have to be deemed acceptable and proportionate. But over half of the suspected targets are located in or near cities; even a single nuclear attack in a major city is likely to kill hundreds of thousands of people.

It is difficult for me to imagine a U.S. president being confident enough in U.S. intelligence to order such a preemptive attack, and confident that he could subsequently justify it, to his own citizens and to the world, as having been necessary.

Critics of the Bush nuclear doctrine have emphasized the damage it does to the nonproliferation regime. They cite the apparent violation of our negative security assurances. They claim that moves by the United States to enhance the usefulness of nuclear weapons will increase pressures on other countries to acquire nuclear weapons, and that it will undermine efforts to persuade other countries not to acquire them. After all, if the United States, by far and away the strongest conventional military power, needs nuclear weapons, then why does not every other country have even more need for nuclear weapons—especially those that face far more challenging security environments than the US?

Defenders of the doctrine note that the decisions of the countries we are most worried about—North Korea and Iran—are not much influenced by US restraint. Their efforts to acquire nuclear weapons won't be diminished if the US reduces the number of nuclear weapons it deploys, if we ratify the CTBT, if we forego a nuclear bunker-buster, or even if we pledge not to use nuclear weapons first.

I tend to agree—US nuclear doctrine has little direct effect on the incentive of such countries to “go nuclear.”

Instead, I think we should focus on how our nuclear doctrine affects our attitudes and our incentives to prevent proliferation and nuclear terrorism. I think we're kidding ourselves if we pretend that our nuclear forces are going to be able to protect us from attack, by preemptively destroying enemy weapons or enemy leaders. Our nuclear weapons are useful only as a deterrent, nothing more.

Plans to use nuclear weapons preemptively are an impediment to thinking about and putting into place other measures that would be more effective.

It's time to admit that the nonproliferation regime is in serious trouble. North Korea probably already has nuclear weapons, and Iran has taken a major step in this direction. Like a perverse Johnny Appleseed, A.Q. Khan spread centrifuge enrichment technology around the world; how widely, we don't know. Those that have it could give it or sell it to others. Several more countries could be producing HEU a decade from now. Some of these countries will be unstable and vulnerable to penetration by terrorists or their sympathizers—Pakistan is the poster child for such worries.

It is terrifyingly easy to make a nuclear bomb out of HEU. The bomb dropped on Hiroshima wasn't tested before it was used; scientists had absolute confidence that it would work as predicted. In the 1960s, nonproliferation experts at Los Alamos National Lab wanted to know how easy it would be for other countries to design a bomb, so they hired two new physics PhDs, Bob Selden and David Dobbs, put them in a trailer and told them to design a bomb without access to any classified information. It was called the "nth country experiment."

By the end of the first few weeks Selden and Dobbs realized that it was so easy to make a gun-type weapon with HEU that it didn't present any real challenge, so they spent the next two years designing a plutonium bomb—which Los Alamos weapon designers concluded would work just fine.

If HEU is sold or stolen, it's quite plausible that a terrorist group could make a gun-type weapon. Although we can deter countries from attacking us with nuclear weapons—assuming we don't invade their country and they have something to lose—it's not clear that terrorists can be deterred.

None of this is certain. We might muddle through, as we are trying to do now—containing the North Korean or Iranian nuclear programs. Perhaps enrichment technology will spread no further; perhaps no HEU will be sold or stolen. Or perhaps not.

Now consider the types of policy initiatives that would be necessary to substantially reduce the risks of nuclear proliferation and nuclear terrorism. They might include:

- A prohibition on uranium enrichment and nuclear spent-fuel reprocessing, except as approved by an international body and placed under international control;
- A prohibition on all use, and stocks of HEU or plutonium, except as approved by an international body and placed under international control;
- A global environmental monitoring network able to detect any secret production of HEU or plutonium; and
- Stringent international standards for the protection, control, and accounting of nuclear explosive materials; declarations of all stocks of nuclear materials; audits to ensure that declarations are accurate and complete; and inspections and red-team exercises to ensure that agreed standards of physical protection are met.

Today there is no chance of putting any of these policies into effect. The Bush administration would prefer to try to impose these measures on selected states of concern—a "just say no" approach to nonproliferation. But that isn't going to work, at least not over the long run.

And this is where prohibition could be a useful concept. A decision by the United States to seriously advocate for the prohibition of nuclear weapons, and to lobby other nuclear weapon states to join it, would dramatically change the terms of debate. It is the one thing I can think of—short of a nuclear detonation—that would get everyone’s attention and would allow such proposals to be seriously considered.

Now, as you may know, the United States formally committed itself to the goal of prohibition when it signed the NPT, and we recommitted ourselves to that goal when the Treaty was extended indefinitely in 1995, including endorsing a sequence of measures to reverse the nuclear build-up. But the current US national security establishment considers this a joke—one of those empty promises that states are obliged to repeat.

John Bolton made the mistake of saying this out loud a couple of years ago. And the 2005 NPT review conference ended in disarray largely because U.S. refused to discuss any new constraints on its freedom to develop, test, deploy, use, or threaten to use nuclear weapons.

I’m talking about something very different from paying lip service to Article VI of the NPT—I’m suggesting that we would propose to supersede the NPT and associated nuclear-weapon-free-zone treaties and other agreements with an entirely new treaty prohibiting nuclear weapons.

This new treaty could contain an enforcement mechanism, or the permanent members of the Security Council could make it clear that they would authorize the use of force against any country found to be violating the Treaty. This proposal could be coupled with a program to make proliferation-resistant nuclear power available to all countries, as a measure to mitigate climate change.

This isn’t going to happen overnight, of course. It would take decades to achieve a prohibition on nuclear weapons. But in the short term there would be many advantages in taking this position—enough, perhaps, to achieve some of the related agenda, such as placing all enrichment and reprocessing facilities and stocks of HEU and plutonium under international control. Many of these things could be done under the banner of laying the groundwork for prohibition. The United States, for its part, can demonstrate its commitment by ratifying the Comprehensive Test Ban Treaty.

You may think I’m dissembling here, because I’m saying that taking a strong unilateral position in favor of prohibition—but not actually getting rid of all our nuclear weapons prior to agreement on a treaty—would put us in a better position to prevent other countries or groups from getting nuclear weapons.

But as a practical political matter, I know that we could not even start down this road unless the U.S. had decided that a treaty prohibiting nuclear weapons, if it could be achieved, would truly be in its own best interests. I think it would be.

By committing the United States to eliminate its nuclear weapons, we would give ourselves the strongest possible incentive to see that no other countries were allowed to get the bomb.

It would also give us the moral and legal authority to assemble broad coalitions to enforce a global prohibition. It is very likely the only path toward removing nuclear weapons from the regions where they are most likely to be used—South Asia and the Middle East.

To put it bluntly, if we aren't going to have nukes, we're going to make damn sure no one else does, either.

Disarming ourselves is best way to communicate to others that spread of nuclear weapons is intolerable, and the best way to compel ourselves to act like we believe it. Threats to use force in order to thwart proliferation would be quite credible if the nuclear weapon states had voluntarily divested themselves of nuclear weapons.

This is very different from today, and from the past three decades, where we constantly say that nonproliferation is a top priority, but every time we are forced to choose we give it a back seat to other concerns—most recently, the “war on terror”.

What about undetected cheating? Here I think the biggest worry is the retention of nuclear weapons by the existing nuclear powers. Having thought long and hard about this, I don't think that any system or monitoring and verification could rule out the possibility that Russia had hidden a few hundred warheads, or that China, Israel, India, Pakistan hadn't squirreled away a few.

In order to sign on to a prohibition, we'd have to be able to live with that risk—just as other countries would have to live with the risk that the United States had sequestered some warheads.

I don't think a handful of bombs in the basements of the current nuclear powers would be a huge threat. And I think it is a risk worth taking, in the sense that it is outweighed by the potential benefits of an agreement and the associated measures to greatly reduce the risks of nuclear proliferation and terrorism.

Bear in mind that any of the countries that now have nuclear weapons could build new weapons from scratch in a matter of months. My first Ph.D. student—Michael Mazaar, wrote a very nice book on the potential of “virtual nuclear arsenals”—nuclear weapons that don't exist, but could be created very quickly—to act as a deterrent to cheating or secret rearmament. Any hidden nukes could be used to advantage at most once, for a period of a few months, until others were able to build some of their own. What would they do with them during that month or two of nuclear monopoly?

Would prohibition carry risks? Of course it would. But the continued overt possession of large nuclear arsenals by ten or more countries carries risks, too—risks that they might be used accidentally or without authorization, or as a result of miscalculation or inadvertent escalation, with unimaginably horrible consequences. Equally worrisome is the risk that nuclear weapons or nuclear materials will be stolen by terrorists, who might decide that their cause will be advanced by the destruction of New York or Washington, or London or Paris.

Most people in the national security establishment believe that the United States can and should and will retain nuclear weapons for the indefinite future. Indeed, the Bush administration currently is making plans to rebuild our capacity to design and produce nuclear weapons. Recently I have participated in discussions about a new program to design a “reliable replacement warhead”—a program to design new warheads that will last throughout the century.

I think it’s interesting that the U.S. isn’t taking any serious steps to deal with climate change, which I think will be a real threat to U.S. over the next 50 to 100 years, but it’s sufficiently worried about the reliability of our nuclear weapons 50 to 100 years from now—and about our ability to design and build new warheads 50 to 100 years from now—that it’s launched a program to deal with this perceived problem.

If we keep nuclear weapons and threaten to use them, so will others. Weapons or materials to build them will be sold or stolen. Eventually, more will join the club. Can this go on forever without a catastrophe? If the answer is “no,” then we ought to start thinking about the alternative, and I don’t see why we shouldn’t start today.

At the meeting on the RRW, which was attended by people from the nuclear weapons laboratories and from strategic command, I asked whether anyone was looking at long-term scenarios where we didn’t have to have highly reliable nuclear weapons 50 years from now, or where we had gotten rid of them altogether.

One guy said “that isn’t our job.” I think it ought to be someone’s job.

Thank you for your very kind attention.