

1 THE VISION OF NUCLEAR DISARMAMENT

CAN MANKIND UNINVENT THE nuclear bomb and rid the world of the greatest military threat to the human species and the survival of the planet that has ever been created? Logic might seem to say of course not. But the president of the United States and a number of key foreign policy dignitaries are now on record as saying yes. They acknowledge that a world free of nuclear weapons remains a vision, not immediately attainable and perhaps not achievable within the lifetimes of most contemporary policymakers. But they believe that the vision needs to be made visible, vibrant, and powerful.

Since former secretaries of state George Shultz and Henry Kissinger, former defense secretary Bill Perry, and former senator Sam Nunn wrote a newspaper column in January 2007 advocating a nuclear-free world, a movement to attempt just that has been gaining in strength. Prominent scholars have lent their voices to the idea.¹ Notably, a group of one hundred signatories (not including the above four) convened in Paris in December 2008 and established Global Zero, a movement whose goal is to rid the world of nuclear weapons by 2030 through a multilateral, universal, verified process. The group wants negotiations on the global

zero treaty to begin by 2019—quite possibly during the term of President Barack Obama’s successor.²

As a “citizens’ campaign,” Global Zero has drawn inspiration from the recent grass-roots effort to craft a land-mine treaty and from the important work of several wealthy and influential private individuals in spearheading global antipoverty campaigns. Its goal is built on earlier work, including the 1996 report of the influential Canberra Commission on the Elimination of Nuclear Weapons.³ Calls for eliminating the bomb are as old as the bomb itself, and there have also been bursts of energy devoted to the disarmament cause at various other moments in the past such as the early to mid-1980s.⁴ But the pace of activity, including the organization of this movement, has accelerated greatly in recent years. The movement now has a serious strategy for moving forward—not at some distant time when miraculous new inventions might make nukes obsolete, but within the next ten years, when a treaty might be written, even if another ten years would be needed to put it into effect.

Will President Obama really pursue Global Zero or some other serious agenda for nuclear disarmament? Will he go beyond the inspiring speech he gave in Prague in 2009, the modest cuts in deployed forces he and the Russians agreed to in the New START Treaty, and the somewhat lowered profile of nuclear weapons set out in his April 2010 Nuclear Posture Review?⁵ These steps are not insignificant, but they still leave the world very far from nuclear disarmament.⁶ The much-heralded Nuclear Security Summit in April 2010 in Washington was worthwhile. But it was primarily notable not for its progress toward nuclear zero but for its promotion of actions to reduce the risks of nuclear theft, accident, and terrorism. For example, Mexico agreed to convert a research reactor from highly enriched uranium (usable in bombs) to lower-enriched uranium (not usable), Ukraine agreed to eliminate its stocks of highly enriched uranium within two years, and the United States and Russia recommitted to eliminating an excess

stock of plutonium.⁷ These steps, as well as the administration's request for a 25 percent increase to fund global nonproliferation activities (to \$2.7 billion in the fiscal year 2011 budget), are entirely sensible.⁸ But whether Obama will push nuclear issues in additional bold new ways anytime soon seems dubious—when on other national security matters such as Iraq and Afghanistan he has been extremely pragmatic and deferential to military advisers, who do not generally appear enthusiastic about nuclear disarmament, and when many other priorities beginning with promoting economic recovery compete for his time and attention.

Perhaps Obama will in effect drop the nuclear disarmament goal. But nuclear crises in Iran and North Korea, among other things, may keep it alive. As this American president realizes, the real motivation for the idea of abolishing nuclear weapons is neither utopian nor futuristic. It is not simply to deny extremist countries the excuse of getting the bomb because others already have it.⁹ Rather, the motivation is to put significant pressure—more so than is possible today—on rogue countries if they pursue such weapons anyway. With leaders in Teheran, Pyongyang, and elsewhere bent on obtaining nuclear weapons, and charging U.S. policymakers with double standards in their insistence that the United States can have the bomb but they cannot, the president's ability to galvanize a global coalition to pressure Iran and North Korea (and perhaps others) into walking back their weapons programs may depend on regaining the moral high ground. And that in turn may require an American commitment to work toward giving up its own arsenal—once doing so is verifiable and once others agree to do the same.

But how to rid the world of nuclear weapons as well as bomb-ready fissile materials? And how to do so safely? Perhaps a nuclear abolition treaty could constructively contribute to global stability if done right. But it could be hazardous if done wrong. Among other things countries that currently depend on America's military protection could decide they should seek nuclear weapons of their

TABLE 1-1. Global Nuclear Weapons Inventories, Late 2009 Estimates

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| Russia | 13,000 |
| United States | 9,400 |
| France | 300 |
| China | 240 |
| Britain | 180 |
| Israel | 90 |
| Pakistan | 80 |
| India | 70 |
| North Korea | 8 |

Source: Robert S. Norris and Hans M. Kristensen, "Nuclear Notebook: Worldwide Deployments of Nuclear Weapons, 2009," *Bulletin of the Atomic Scientists* (November/December 2009), p. 87 (www.thebulletin.org [December 2009]); and Larry A. Niksch, "North Korea's Nuclear Weapons Development and Diplomacy" (Congressional Research Service, May 27, 2009) (<http://italy.usembassy.gov/pdf/other/RL33590.pdf> [December 2009]).

own. If the Turkeys and Saudi Arabias and Japans and Taiwans of the world interpret the U.S. debate over nuclear disarmament to imply that they can no longer rely on the United States as a dependable strategic partner (a formal ally in the cases of Turkey and Japan, an informal but still trusted friend in the cases of Saudi Arabia and Taiwan)—because it no longer takes deterrence as seriously as before—serious consequences could result. The Global Zero movement could wind up sparking the very wave of nuclear proliferation and instability it hopes to prevent. Sam Nunn (not himself a member of the Global Zero movement because of its near-term schedule for pursuing a disarmament treaty) uses the image of nuclear disarmament as a mountain—with the summit currently beyond reach and perhaps out of sight. He advocates moving from the current position to a higher base camp (meaning much deeper disarmament and related measures) to determine if the summit can in fact be reached at some point.¹⁰ That image makes sense—but the United States and its allies must also be safe on the way to the new base camp and avoid committing to a particular route to the top too soon.

So far, not enough advocates of the nuclear disarmament idea are addressing, or even acknowledging, such complexities and complications. Some are doing so, and I have benefited greatly from the work of scholars such as George Perkovich, Barry Blechman, Bruce Blair, Hal Feiveson, and Frank von Hippel in writing this book. Jonathan Schell's original concept from the 1980s of dismantling nuclear arms while recognizing the possible need to reconstitute them—particularly in the cold war setting about which he wrote then—also informs my vision of what a practical nuclear disarmament regime might be. But today's movement as a whole still begins with a desired destination and then tries to find ways to make it happen. My analytical approach is different—instead of working backward from a desired endpoint, it follows an empirical and deductive approach to assess the feasibility of eliminating nuclear weapons, starting with first principles of international security, modern history, and nuclear physics.

This book does not argue against the notion of nuclear abolition; it is in fact a friendly skeptic's case *for* nuclear disarmament. But I emphasize the conditions and caveats that would have to accompany any such treaty regime—including clear rules for ways the major powers might consider temporarily rearming themselves with nuclear arms in the event of a future violation of the treaty regime, even after weapons had been eliminated. The scenarios here are potentially more complex than many nuclear disarmament advocates have acknowledged to date. What if a dangerous country is suspected of having an active nuclear weapons program, and verification cannot resolve the matter? What if a country develops an advanced biological pathogen with enormous potential lethality—and perhaps even an antidote to protect its own people? Would nuclear deterrence truly be irrelevant or inappropriate as a means of addressing such a problem?

Many, if not most, advocates of nuclear disarmament consider the abolition of nuclear weapons the moral equivalent of the abolition of slavery—and imply that, just as with slavery, once

eliminated, nuclear weapons should be gone for good (absent a blatant violation of the treaty by a country that chooses to build a nuclear arsenal in the future). This is a dangerous way to portray the vision of disarmament, however, for it would deprive the United States of deterrent options that may be needed someday given the unpredictable future course of human history. In other words, even once nuclear weapons are eliminated, they may not be eliminated forever. At a practical level, the world will likely have many nuclear power plants as well as all the nuclear waste that nuclear bomb and energy programs will have generated; fissile material can be gleaned from all of these sources. The knowledge to make nuclear weapons will not disappear, and relevant nuclear materials will not do so either.

What of the issue of timing—not only of when to try to negotiate and then implement a treaty but how to describe the vision of nuclear disarmament in the short term? Many nuclear disarmament advocates pull back the minute anyone asks if they want a treaty soon, recognizing the impracticality of trying to abolish nuclear weapons in the next few years. But they are the ones who elevated the idea in the contemporary nuclear debate to a level not seen for many decades, so putting off the timing issue is neither consistent nor advisable. In fact, there are good reasons to have this debate now. Eliminating nuclear weapons from the face of the Earth has technically been a goal of U.S. policy since the 1960s, for example. Moreover, the slowness of negotiating the recent New START Treaty with Moscow and the likely slow ratification debates over both it and the Comprehensive Nuclear Test Ban Treaty in the coming years suggest the possibility that nuclear debates will bog down in technicalities and mundane practicalities, losing sight of the big picture. So bold ideas are useful to provoke fresh thinking and serious action. That said, the ideas of nuclear disarmament advocates are already raising questions around the world about how long the American extended deterrent can be depended upon to help ensure regional peace in key

theaters. The resulting perceptions can in turn affect countries' decisions about whether to pursue their own bombs—not only extremist nations but even friendly states that worry they may no longer be able to depend on the United States.

I argue for a middle-ground position. Moving to nuclear disarmament soon by trying to write a treaty in the next few years is too fast. But dropping the subject for now and waiting for the twenty-second century or some other distant date is too slow.

In addition to possibly spooking U.S. allies who worry about how they will ensure their security in a dangerous world, there are two problems with trying to abolish nuclear weapons too soon. Deterrent arrangements that are working today, but that are also somewhat fragile, could be disrupted; and states entirely disinterested in nuclear disarmament might be encouraged to build up arsenals in the hope that their nascent nuclear power might be greater as the existing nuclear powers build down. The main problem, though, is that the nuclear disarmament notion simply lacks credibility in a world in which even some existing nuclear powers clearly have no interest in denuclearizing anytime soon (even if the United States did). Absent a serious process for moving toward zero, declaration of ambitious but arbitrary and unattainable deadlines for action is more likely in the end to discredit the initiative than to advance it.

The problem with putting off debate about nuclear disarmament, however, is that existing powers remain in a weak position to pressure would-be proliferators to abstain from the pursuit of nuclear weapons. Procrastination also perpetuates a false sense of complacency about the supposed safety of living with the bomb. What is needed is a prudent form of urgency. Neither haste and impetuosity nor indefinite postponement of the issue will do.

The United States should endorse a nuclear-free world with conviction, as President Obama did in his 2009 Prague speech. But it should not work to create a treaty now and should not sign any treaty that others might create for the foreseeable future. The

right time horizon for seriously pushing a new nuclear accord is when most of the world's half dozen or so major territorial and existential issues involving major powers are resolved—and this cannot be set to a calendar as precisely as the Global Zero movement would like. Discussed further below, these issues include the status of Taiwan, the issue of Kashmir, political relations between Russia and the key “near-abroad” states of Georgia and Ukraine, and the state of Israel. Nuclear crises involving Iran and North Korea also need to be addressed, although the beginnings of a move toward nuclear disarmament might not have to await their complete resolution. Once these contentious matters are largely resolved, the plausibility of great-power war over any imaginable issue that one can identify today will be very low. That will in turn make the basic structure and functioning of the international political system stable enough to risk moving toward a nuclear-free world—a process so radical as to be inherently destabilizing in some sense and thus prudent to pursue only when the great powers are in a cooperative mode and undivided by irredentist territorial issues.

Some will argue that there is no foreseeable period of great-power peace and thus no prospect of the preconditions required for moving to a denuclearized world. They believe for the most part that the prospects of great-power war in the future will be as, or nearly as, great as they were in prenuclear eras of human history. Such individuals often call themselves realists and imply that ideas such as nuclear disarmament are just too utopian to be within mankind's reach. But as argued below, this so-called realist argument is also problematic—the history of fallible mankind, and particularly of the nuclear age to date, makes it hard to believe that nuclear weapons will never be used if they continue to occupy a central role in international politics. If realism means that nuclear war likely will occur someday, how can such a worldview be called prudent—indeed, how can it even be called realist, with all the connotations of pragmatism that the term implies?

That said, my vision for nuclear disarmament is one of dismantling nuclear warheads—a vision that should not be confused with their permanent abolition, a term favored by some. The desire to eliminate such weapons forever is understandable, given their incredible destructive power; most plausible uses of nuclear weapons would in fact be inhumane and illegitimate. But it is war itself that is most inhumane, and war targeting civilians through whatever means is the fundamental moral blight we should be trying to eliminate. Certain forms of highly lethal biological weapons attack with advanced pathogens, large-scale conventional conflict resembling the world wars, and wars that include genocide could be every bit as inhumane as a nuclear attack. Outlawing nuclear weapons in a way that increases the prospects of other types of immoral warfare would be no accomplishment at all. Therefore, even as the international community strives to dismantle nuclear weapons, it needs practical options for rebuilding them should other perils present themselves—not only suspected pursuit of nuclear arms by a country bent on violating the accord but perhaps also the development of advanced biological pathogens (a threat the Obama administration's 2010 Nuclear Posture Review considers¹¹) or an especially threatening conventional military buildup by a future extremist state. That is the broad, strategic argument in favor of preserving options for reconstitution, even after a nuclear disarmament treaty is signed and implemented.

Any disarmament treaty must therefore allow a country like the United States the right of temporary withdrawal from the treaty not only for obvious nuclear weapons violations by a threatening state, but even for suspected nuclear weapons violations—as well as for advanced biological pathogen programs and extremely threatening conventional military buildups by a major power. This list of exemptions is far longer than most nuclear zero proponents favor or are even willing to countenance. But the nature of international relations, and of modern weaponry, leave

little choice in the matter. The terms by which the right of temporary withdrawal could be exercised must be stated as clearly as possible, and a burden of proof must be placed on any state or group of states exercising the right. Giving the UN Security Council the ultimate say in whether temporary nuclear weapons reconstitution is allowable would not be a sound idea, but the council should have an opportunity to hear the argument of a country that believes it must rearm in response to the belligerent actions of another. In addition, a contact group of states with varying political perspectives should be created, able to hear and discuss sensitive intelligence, for each country that might someday consider the option of rearming. The contact group would not have veto power either, but it would be able to offer independent assessments on whether a defensive form of rearmament was warranted. For the United States, such a group might include not only traditional close allies but countries like Brazil and India.

Capricious or blatantly self-serving reconstitution must be avoided. But a nuclear disarmament treaty that precluded the international community from responding to the actions of an advanced military power strongly suspected of pursuing nuclear, biological, or enormous conventional military capabilities would be a chimera. The terms of such a treaty would not withstand the stresses that the real world might place upon it, should such a threatening state challenge the global order at some future point. In other words, such a treaty would be violated by countries faced with acute threats to their own security. A treaty that possesses such inherent contradictions should not be drafted.

There is also a technical reason to view reconstitution as a real future policy option, even short of circumstances in which another country has egregiously violated the accord by building up a new nuclear arsenal. Simply put, nuclear weapons will always be within reach of mankind in the future, whatever we may do, whatever we may prefer. Even as they improve, verification methods will almost surely not be capable of fully ensuring that all

existing materials are dismantled or destroyed. The laws of physics make it very hard to be certain that all bombs and bomb-grade materials had been eliminated in all parts of the world. Even more so, the future of the nuclear power industry makes it very likely that bomb-grade materials will be salvageable from nuclear fuel or nuclear waste within months of a decision to do so. In other words, not only is permanent, irreversible abolition unwise, it is also probably impossible. But dismantlement of all existing bomb and fissile material inventories, in recognition of the fact that the day-to-day role of nuclear weapons in international security is dangerous and ultimately unsustainable, should become the goal, as President Obama has rightly emphasized.

Some might argue that with all these caveats and conditions, a nuclear disarmament treaty, even one that is patiently and prudently pursued, is not worth the trouble. They underestimate both the danger posed by nuclear weapons and the positive power of ideas and ideals in international politics. These weapons are so heinously destructive as to be illegitimate; they are indiscriminate killers, and they have proven to be far harder to build and handle safely than many understand. Even more harm could be caused today by moving precipitously to eliminate them than by keeping them. That said, nuclear weapons have no proper role even as visible deterrents in the normal interactions of states, and the United States should aspire to a world—and try to create a world—in which they would no longer have such an active, operational role.

The Motivation of the Abolition Movement

Twenty years after the cold war ended, those favoring the elimination of nuclear weapons often point to four main motivations.

First, the weapons are simply inhumane. They kill indiscriminately and are immensely destructive, leaving them no proper place in the national security policies or armed forces establishments of respectable countries. If conventional weapons such as napalm, carpet bombing, and incendiary weapons are no longer

used because they are considered immoral, then a type of weaponry with hundreds of times the lethality should not have any legitimate place in a country's military arsenal either.

Second, the basic logic of the Non-Proliferation Treaty (NPT) seems unsustainable. The NPT was built on double standards—those that apply to the nuclear haves, and those that apply to the have-nots. But when negotiated in the 1960s, during a period of intense cold war arms racing, the idea that the United States and the Soviet Union would disarm was unrealistic. The only realistic goal for the superpowers seemed to be that they curb their nuclear competition. So the NPT was in that sense a practical response to the world in which it was negotiated. With the cold war over, the logical inconsistency, and political unfairness, of an NPT regime in which some countries are allowed nuclear weapons in perpetuity while others are denied them categorically seems increasingly unsustainable.

The NPT itself also calls for an end to these double standards—specifically, Article VI calls for “general and complete disarmament.” That reads like utopianism to many, because the language implies an end to all organized military forces, not just nuclear abolition.¹² But the NPT review conference of 2000 reaffirmed the nuclear aspect of the goal, making disarmament simply impractical to ignore, since it is now part of the bargain that commits most states not to pursue their own nuclear arms.¹³

Third, abolitionists argue that “loose nukes” remain a serious worry. During the cold war, when the states possessing nuclear weapons were few in number and typically strong in their internal controls, this worry was not so great. But with at least nine nuclear powers today, three or four of them subject to possible internal strife, the danger of theft or confiscation is very high. We should not hyperventilate over the imminence of the threat, as academic John Mueller has rightly pointed out.¹⁴ But to trivialize the destructive force of these weapons, or to assume that no nuclear accident or other disaster will happen in the future

because one has not happened in half a century, would be to make a major mistake in the opposite direction of complacency, as the next chapter will argue. The dangers seem destined to keep growing as the nuclear club possibly expands further—a development that may accelerate with the world’s renewed interest in nuclear power, since preparation of nuclear fuel inherently involves many of the same technologies that are used to produce fissile materials for weapons. We should consider ourselves lucky that a loose nuclear weapon or mass of plutonium or enriched uranium has not harmed anyone yet, rather than grow complacent.

Fourth, the domestic politics of this “big idea” could be transformative in engaging the public on the issue, at least in theory. Tired of incrementalism, the American public has long since lost its real interest in arms control. So has much of the rest of the world. As a result, when accords such as the Comprehensive Test Ban Treaty come up for Senate ratification, there is little popular engagement and treaty opponents can carry the day. Only a revolutionary proposal can break this logjam and lead to a true national debate in which obstructionist forces can be challenged and defeated—or so the argument might go. A similar logic may apply to the internal politics of numerous other nuclear nations.

Counterarguments

All of these abolitionist arguments have some merit. But there are also strong counterarguments that raise the stakes in the debate to a very high level. In short, we may not be able to live safely with nuclear weapons, yet it is not clear how we could live safely without them.

Much of the cold war nuclear literature is filled with discussions of “extended deterrence”—devising credible ways for a nuclear power like the United States to persuade would-be aggressors not to attack its allies. Nuclear weapons had a large role in this debate when the possible enemy was a hypermilitarized Soviet Union abutting key American allies. As Keith Payne points out,

in addition to deterring would-be aggressors, American security commitments must also provide positive *assurance* to friends and allies. That is especially critical when the goal is prevention of nuclear proliferation, since nervous allies may elect to build their own nuclear arsenals to feel comfortable with their own security circumstances.

Perhaps the tasks of both extended deterrence and assurance are easier now that the Soviet Union is gone. And in many ways these tasks surely are easier for the United States and a large number of its allies. But Russia may feel an even greater need for nuclear weapons now than it did during the cold war, given Western conventional military superiority.¹⁵ This is a complicating matter in any pursuit of nuclear disarmament, because without the support of other powers for the idea, there can be no world-wide elimination of nuclear weapons.

And even the United States and its allies face complications in this more complex period of multiple nuclear powers that some have called the “second nuclear age.”¹⁶ To take one example, is Japan really confident it will never need nuclear weapons to deter a rising China? And if Japan gains nuclear weapons, what will South Korea, then surrounded by four nuclear weapons states, choose to do? Worst of all, perhaps, will Taiwan really believe that an already-indirect American security pledge is reliable enough that it can forgo a nuclear capability of its own? Since China has in the past declared that Taiwanese pursuit of nuclear weapons would be grounds for war, this scenario is very troublesome.

The situation is also very difficult in the Middle East. To be sure, Iran is attempting to justify its own nuclear programs by exploiting the alleged hypocrisy of the NPT regime and the established nuclear powers. Depriving Teheran of this excuse for its nuclear ambitions would seem to argue in favor of a nuclear abolition treaty. But few countries really seem swayed by Teheran’s arguments. Rather, their commercial interests in Iran, or their inherent belief in positive diplomacy as a tool for improving other

states' behavior, or even a desire to frustrate the United States seem to be more important factors limiting their willingness to get tough with the Iranian regime. The world's acute need for Iran's oil further compounds the problem. It is not clear that the double standards of the NPT are the core of the problem.

Iran has made direct and grave threats against Israel in recent years. It has also thrown its weight around quite a bit in the region, in Iraq, Lebanon, and the Persian Gulf, to the point of threatening the stability of ruling regimes. Under such circumstances, American steps toward nuclear disarmament could produce undesired dynamics. Countries like Saudi Arabia that do not have formal security alliances with the United States could be extremely skittish about facing an Iranian nuclear capability without their own deterrent, should Washington join other key capitals in moving toward a nuclear-free world. They may fear that Iran would cheat even after signing such a treaty. Teheran might then try to intimidate its neighbors, who could worry that Iran possessed the bomb even after the United States had deprived itself of its own arsenal. In addition, reports continue to appear now and again of possible arrangements under which Pakistan would provide Saudi Arabia with nuclear weapons in a crisis situation if need be.¹⁷ In recent work at Brookings, Martin Indyk and others have suggested that in response to Iran's apparent ambitions, the United States might need to *increase* rather than diminish the robustness of its nuclear guarantees to key regional friends if it is to discourage them from acquiring nuclear weapons of their own.

Some argue that, with the cold war over and American military preponderance so clear to all, nuclear umbrellas are no longer needed to ensure deterrence. Overwhelming conventional military superiority can suffice, they say—even if an adversary might itself have chemical or biological arms or a secret nuclear bomb program. But this argument is facile. Conventional military dominance is harder to attain, and sustain, than many acknowledge; in many cases translating that dominance into rapid and decisive

victories can be equally difficult. In the aftermath of the Iraq and Afghanistan wars, it is impossible to know just how willing Americans will be to use force to defend far-away allies—especially if adversaries might use or threaten to use weapons of mass destruction. And as I have argued, along with others, for years, trends in military technology are not making the task of deploying decisive military force to distant regions radically easier. Even classic defensive missions can be hard to conduct with conventional arms alone. In other words, situations like the Iraqi invasion of Kuwait in 1990 or Serbian attacks on Kosovar Albanians in 1999 cannot be confidently prevented, and rolling back such aggressions, especially by a more advanced state, can be hard. Of course, nuclear deterrence will often be of dubious relevance to such scenarios too, but it may be helpful in certain egregious cases; the possibility cannot be dismissed.¹⁸

Some also hope that missile defenses may improve enough that offensive nuclear weapons will fade in significance, and defenses become dominant, in many key regions of the world. Yes, missile defense can lower the odds of successful attack, especially by lesser powers with small missile arsenals of limited sophistication. But a reliable missile defense against advanced threats has yet to be built. If the day ever arrives when such a defense is possible, it will be far into the future. Currently, missile defenses would do very well to intercept a few warheads launched without advanced countermeasures from a predictable location. Larger attacks, surprise attacks, and sophisticated attacks will probably be capable of punching through available defenses for a very long time to come.

Then there is the problem of verification. Nuclear arms control agreements to date have limited large objects, such as intercontinental ballistic missile silos and heavy bombers; the agreements have indirectly constrained missile warheads, air-launched cruise missiles, and the like by counting the launchers that carry them. The world today is full of additional bombs, a great deal of additional bomb material, and nuclear waste and energy facilities in

dozens of countries that contain materials that could be diverted to weapons purposes. Sometimes the country holding relevant material does not know the exact amounts in its possession. Fissile materials can be shielded well enough that their physical emissions are apparent only to detectors within a few dozens of meters of their locations. In other words, their characteristic signatures are not easily noticed, making verification that they have been eliminated difficult if not impossible. Even centrifuge facilities and other possible technologies for uranium enrichment can be rather well hidden. Arms control protocols allowing inspections of suspected sites can help—but they work only if outsiders can articulate their suspicions with enough precision to allow inspectors to target the right locations. This usually requires having defectors or spies inside a country who are able to develop initial leads on illicit programs. Gaining such tip-offs in timely fashion cannot be taken for granted. Some argue that in the future, changes in global morality will make it much more likely that “societal verification” could unearth a bomb program from within a state bent on cheating. This assumption would seem optimistic given the long history of extremist states being able to convince or coerce their own citizens to remain silent even in the face of enormous atrocities committed by governments against their own people or their neighbors.

Biological pathogens are another complicating matter. If a modified form of smallpox, perhaps genetically joined with a very contagious influenza-like organism, could be developed and then employed against populations, millions could die. The attacking country, knowing more about the properties of the pathogen it had developed than anyone else, might be able to inoculate its own citizens against the disease in advance. Perhaps even more plausibly, it might claim it had such an antidote and then threaten to unleash the biological agent on other countries if they did not accede to its demands of one type or another. How could such attacks—or perhaps other types of mass casualty attacks that

currently cannot be foreseen—be deterred absent nuclear weapons? A conventional response requiring many months of preparation and combat could be tough to execute if many of the soldiers of the retaliating country were falling ill from a disease that their doctors were powerless to prevent or to cure.

A Realistic Path to Zero—And a Realistic Definition of Zero

In the end the arguments both for and against nuclear disarmament are extremely strong. How to resolve them?

First, a word on timing. The world is not ready to take even the initial steps toward negotiating a nuclear disarmament treaty. It will not be ready until great-power peace is more firmly established, necessitating progress on key issues in East Asia, South Asia, the Middle East, and eastern Europe. These matters cannot be set to a calendar, so current aspirations for developing even a notional timeline for pursuing a binding global zero accord are unwarranted. In fact, they are potentially harmful because they convey the sense that somehow the great powers (or some of them) have made nuclear weapons abolition a higher priority than the preservation of great-power peace. That would be a major strategic mistake.

Looking further down the road, this book supports the nuclear disarmament agenda—but only by recasting it. Rather than think of an absolute end state, in which nuclear weapons are abolished forever, treaty proponents will have to be more realistic. They will have to settle for a world in which all nuclear weapons are in fact disassembled and destroyed—but in which the ability to rebuild a modest arsenal fairly quickly is preserved technically, politically, and legally. Such an arsenal would be built only in an extreme situation. Ideally, such a reconstitution option would never be invoked, but it is critical that the option be retained. Nuclear zero should not amount simply to de-alerting or disassembly of weapons, with stocks of fissile materials at the ready (above and beyond those modest amounts of materials that could be quickly available

through the nuclear energy fuel cycle). A world of weapons-grade and bomb-ready highly enriched uranium and plutonium, maintained in significant quantities, would retain nuclear weapons too close to the center of international military planning and global power relationships.¹⁹ But a nuclear disarmament accord should generally permit what cannot be banned verifiably. As such, *plans* for reconstitution should be fairly robust even if facilities and materials for rebuilding arsenals should not be. Given that the existence of nuclear power plants will give many governments the option of building arsenals within months, even if highly enriched uranium can be eliminated as a fuel and even if plutonium reprocessing is stopped, these plans should be fairly “warm.”

Ruling out the option of reconstitution claims more knowledge about the future than anyone can have. Some proponents of eliminating the bomb recognize this, but others do not, and in most cases the mechanisms of planning for reconstitution are not given adequate thought. In fact, a central element of any nuclear disarmament regime must be a way to end or at least suspend that regime—in diplomatic, legal, military, and technical terms.

Hoping otherwise, and assuming that eliminating nuclear weapons by treaty means abolishing them forever, presupposes a favorable international security environment among the great powers that may not endure permanently. It therefore runs too high a risk of driving security-conscious states to build nuclear arsenals themselves. It risks worsening the very proliferation problem that the disarmament goal is designed largely to address.

Perhaps the world can get rid of nuclear weapons—as long as it knows that it can rebuild them in the event of a sufficiently grave violation of the regime by an aggressive country. Under such circumstances, the world will need legal and physical mechanisms for deciding whether to rebuild a nuclear capability to punish a regime violator. Not only the obvious case of a violating state building nuclear weapons but also other possible actions need to be woven into the framework. High suspicion that an aggressive

state is building a bomb may suffice to justify others rearming, at least temporarily, even without hard evidence or irrefutable proof. Extremely lethal biological pathogens in the hands of a ruthless regime may also legitimate reconstitution of another country's arsenal, depending on circumstances, as described in chapter 3. Indeed, genocide carried out with conventional weapons may itself be reason enough.²⁰

The Manhattan Project was clearly motivated largely by American fears about Germany's bomb program. But replaying the events of World War II in one's imagination, it is hard to argue that the United States should have eschewed nuclear weapons even if it knew full well that Nazi Germany and Imperial Japan could not get them. One can admittedly still debate whether the United States should have used its nuclear weapons, but the argument that it should have made denuclearization a higher priority than ending a war that killed more than 50 million people is far from persuasive.

As subsequent chapters explain, a nuclear disarmed world requires a strategy for reconstitution *before* a treaty is even pursued, to avoid possibly pernicious and counterproductive dynamics as the treaty is negotiated and implemented. From an American perspective, this includes:

—Specific clauses in the treaty allowing reconstitution in the event of a direct violation of the treaty by another party (this provision is probably already a given).

—More controversially, clauses allowing nuclear reconstitution in the event of development of a particularly lethal advanced biological pathogen or other highly threatening weapon (even including a sufficiently extreme conventional military buildup).

—Clauses allowing a government to bring intelligence information to the UN Security Council if it fears that another government is violating the treaty and wants to respond quickly. In other words, there must be a mechanism for debating violations *before* they culminate in actual production or deployment or use of a bomb.

—A U.S. capacity, including access to facilities at a place such as Los Alamos National Laboratory (and other sites, in case the main site is attacked preemptively), to reconstitute a team of nuclear weapons experts capable of rebuilding a modest number of warheads within months of a decision to do so. Other countries may of course choose to exercise a similar right.

—An American statement to the effect that even if the UN Security Council rejects an argument that another country is believed to be building nuclear or advanced biological agents, the United States reserves the right under Article 51 of the UN Charter to rebuild a nuclear arsenal anyway, once a contact group of countries had been familiarized with the U.S. case for reconstitution and allowed to comment publicly. This right would have to be invoked only in a truly extreme case, should be temporary in its application—and ideally would never be needed. But absent such a statement, America's role as a guarantor of the security of many other countries would be at risk, and the incentives for others to build their own weapons would increase undesirably. Once again, the proliferation costs could easily outweigh the benefits; more states rather than fewer might wind up with the bomb.

The book concludes with discussion of the near-term nuclear policy agenda. Nuclear disarmament will take a long time to achieve under the best of circumstances. To ensure that the nuclear disarmament agenda does not become as irrelevant to near-term policymaking, and ultimately as utopian in character, as Article VI of the Non-Proliferation Treaty, therefore, we must look for ways for it to influence the current policy agenda at least modestly. In fact, there are ways to do so. These include the more rapid elimination of excess warheads than some might favor, greater efforts to develop inspection and verification concepts for warheads as well as fissile materials, and a continued effort by the United States to design ballistic missile defense systems that other major powers find generally nonthreatening.