

The Problem of Nuclear Weapons and What To Do About It

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The world faces two existential threats: climate change and nuclear Armageddon. Action on both is required urgently. Those who reject the first are derided as denialists (and in Australia and Canada today they are also known as the government); those dismissive of the second are praised as realists. The nuclear peace has held thus far as much because of good luck as sound stewardship. Having learnt to live with nuclear weapons for 69 years, we have become desensitized to the gravity and immediacy of the threat. The tyranny of complacency could yet exact a fearful price with nuclear Armageddon. It really is long past time to lift the shroud of the mushroom cloud from the international body politic.

Forty-four years after the NPT came into force, the world still finds itself perilously close to the edge of the nuclear cliff. The cliff is perhaps not quite as steep as it was in the 1980s, but going over it would be fatal for planet Earth. Authoritative roadmaps exist to walk us back to the relative safety of a denuclearized world, but a perverse mixture of hubris and arrogance on the part of the nuclear-armed states exposes us to the risk of sleepwalking into a nuclear disaster. Even a limited regional nuclear war in which India and Pakistan used 50 Hiroshima-size (15kt) bombs each, could lead to a famine that kills up to a billion people.¹

Nuclear weapons may or may not have kept the peace among various groups of rival states; they could be catastrophic for the world if ever used by both sides in a war between nuclear-armed rivals; and the prospects for their use have grown since the end of the Cold War. For nuclear peace to hold, deterrence and fail-safe mechanisms must work every single time. For nuclear Armageddon to break out, deterrence or fail safe mechanisms need to break down only once. This is not a comforting equation. It also explains why, unlike most situations where risk can be mitigated after disaster strikes, with nuclear weapons all risks must be mitigated before any disaster.²

Deterrence stability depends on rational decision-makers being always in office on all sides: a dubious and not very reassuring precondition. It depends equally critically on there being no rogue launch, human error or system malfunction: an impossibly high bar. The number of times that we have come frighteningly close to nuclear holocaust is simply staggering.³ According to one US study, more than 1,200 nuclear weapons were involved in significant incidents between 1950 and 1968 because of security breaches, lost weapons, failed safety mechanisms, or accidents resulting from weapons being dropped or crushed in lifts, etc. In 1980, for example, a dropped socket punctured the fuel tank of a Minuteman II missile mounted with a 9MT warhead at a missile silo in Texas. One man was killed in the explosion and the warhead was thrown several hundred feet.

¹ Ira Helfand, *Nuclear Famine: A Billion People at Risk – Global Impacts of Limited Nuclear War on Agriculture, Food Supplies, and Human Nutrition* (Somerville, MA: International Physicians for the Prevention of Nuclear War, April 2012), <http://www.ippnw.org/nuclear-famine.html>.

² See Martin E. Hellman, “How Risky Is Nuclear Optimism?” *Bulletin of the Atomic Scientists* 67:2 (2011), pp. 47–56.

³ Eric Schlosser, *Command and Control* (London: Allen Lane, 2013).

The most graphic example is the 1962 Cuban missile crisis. The US strategy was based on the best available intelligence which indicated that there were no nuclear warheads in Cuba. In fact there were 162 warheads already stationed there, and the local Soviet commander had taken them out of storage to deployed positions for use against an American invasion.⁴ In November 1983, in response to NATO war games exercise Able Archer, which Moscow mistook to be real, the Soviets came close to launching a full-scale nuclear attack against the West under the misapprehension that a NATO nuclear attack was imminent. And the West was blissfully unaware of this at the time. Any nuclear war in 1983 would have used much more destructive firepower than in 1962.

As for near-miss in an accident, it as now been confirmed that in January 1961, a 4MT bomb (that is, 260 times more powerful than Hiroshima) was just one ordinary switch away from detonating over North Carolina – whose effects would have covered Washington, Baltimore, Philadelphia and even New York City – when a B-52 bomber on a routine flight went into an uncontrolled spin.

There is a significant economic cost. Nuclear weapons have not permitted any of the nine states that have them to buy defence on the cheap. There is the added risk of proliferation to extremist elements through leakage, theft, state collapse and state capture. There are political costs. A nuclear program breeds excessive centralization of political control and obsessive secrecy. It can lead to the creation of a national security state with a premium on governmental secretiveness, reduced public accountability and increased distance between citizens and government. Relying on secrecy and obfuscation, a nuclear program undermines democratic accountability and contributes instead to a culture of lies and evasions. Shielding the program from public scrutiny hides the inefficiency, malpractice, mismanagement and dangers – and nuclear technology is unforgiving when things go wrong. In addition to close calls based on miscalculations and misperceptions and accidental near misses, the nuclear age has also left a trail of grave environmental damage.

NPT

The NPT has kept the nuclear nightmare at bay for over four decades. The number of countries to sign it embraces virtually the entire family of nations. The number of countries with nuclear weapons is still – if only just – in single figures. Yet at the same time, the nuclear arsenals of the five NPT-defined nuclear weapons states (NWS) expanded enormously under the NPT umbrella. The global total number of nuclear warheads climbed steadily after 1945, peaked in the mid-1980s at more than 70,000, fell dramatically for about a decade, and then stabilized in the new millennium. Currently there are under 17,000 nuclear weapons stockpiled by the world's nine nuclear-armed states. Thus the threat has far from disappeared. In fact it remains acute. In today's stockpiles, 5,000 warheads are launch-ready and 2,000 of these are held in a state of high operational alert.

With four decades having elapsed since 1968, the five NPT-licit NWS (N5: China, France, Russia, UK, USA) must be deemed to be in violation of their solemn obligation to disarm, reinforced by the advisory opinion of the World Court in 1996 that the NPT requires them to engage in *and bring to a conclusion* negotiations for nuclear abolition. Despite this history and background, a surprising number of arms control experts focus solely on the non-proliferation side to demand denial of technology and materiel to all who refuse to sign and abide by the NPT, and punishment of any who cross the threshold.

⁴ Robert McNamara, "The Conference on Disarmament should focus on steps to move toward a 'Nuclear Free World'," *Disarmament Diplomacy*, No. 4 (April 1996).

The symbiotic link between non-proliferation and disarmament is integral to the NPT. Most countries gave up the weapons option in return for a promise by the N5 to engage in good-faith negotiations to eliminate nuclear weapons. It was expected that nuclear disarmament could take some time. Accordingly, unlike the non-proliferation obligations, the Article 6 disarmament obligation was not brought under international monitoring and enforcement. But the logics of nuclear disarmament and non-proliferation remain inseparable. The most powerful stimulus to nuclear proliferation by others is the continuing possession of nuclear weapons by some. In the Middle East, for example, it simply is not credible to believe that Israel can be permitted to keep its unacknowledged nuclear arsenal indefinitely, while every other state can be stopped from getting the bomb in perpetuity.

Within the constraints of the NPT, a non-nuclear industrialized country like Japan can build the necessary infrastructure to provide it with the 'surge' capacity to upgrade quickly to nuclear weapons. By relying on the promise of signatories to use nuclear materials, facilities and technology for peaceful purposes only, it empowered them to operate dangerously close to a nuclear-weapons capability, as the world has discovered with respect to Iran. It proscribed non-nuclear states from acquiring nuclear weapons, but failed to design a strategy for dealing with non-signatory countries. It permits withdrawals much too easily as North Korea did in 2003. It is impossible to deal with non-NPT nuclear-armed states from within the treaty. The odd result is that the five NPT-licit NWS have a legal obligation to eliminate their nuclear weapons under Article 6, but India, Israel and Pakistan have no such obligation. It also means that the non-NPT nuclear-armed states cannot be asked to join the nuclear-weapon-free zone (NWFZ) protocols, even if they are regionally relevant. And suggestions for NPT-equivalent disciplines to be applied to them have not gone very far to date.

There are other problems with the NPT. Israel, even though it is not an NPT signatory, will not openly admit to its nuclear weapons stockpiles. India and Pakistan have been accepted, more or less, as *de facto* nuclear weapons powers. The definition of a NWS is chronological – a country that manufactured and exploded a nuclear device before 1 January 1967. India, Pakistan, Israel, North Korea or Iran could test, deploy and even use nuclear weapons, but cannot be described as NWS. Conversely, Britain and France could dismantle their nuclear edifice and destroy their nuclear arsenals, but would still count as NWS. This is an Alice-in-Wonderland approach to affairs of deadly seriousness. But can the NPT definition be opened up for revision through a formal amendment of the 189-member treaty with all the unpredictable consequences?

Nuclear weapons were invented to cope with Germany, used to defeat Japan, and deployed most extensively against the Soviet Union. As their primary strategic rationale disappeared with the end of the Cold War, Washington's evolving nuclear policies acquired greater regional specificity. In East Asia, for example, continued US attachment to nuclear weapons and doctrines was seen as proof of a shift in stance – from deterrence to compellence and coercion – and provoked more assertive Chinese nuclear policies and nuclear brinkmanship by North Korea, which in turn produced self-vindication in Washington. Conversely, even a cursory probing of the sources of instability that impel countries towards nuclear acquisition confirms the link between the denuclearization of individual states, the security dynamics of the regions in which they are located, and universal disarmament. Iran, for example, has hostile and potentially hostile nuclear weapons and troops of nuclear-armed powers all around it, in the east (India, Pakistan, US and NATO in Afghanistan), north (Russia), west (US in Iraq, Israel) and south (US naval forces). This explains why its national security strategy cannot be delinked from regional and global dynamics. The world is at a loss on how to stop Iran from crossing the nuclear weapons threshold, and on how to persuade, coax or coerce North Korea to step back into the NPT as a denuclearized member in good standing.

The NPT is creaking badly even with respect to its nuclear energy bargain as the nexus of security, economic, energy and environmental imperatives can no longer be adequately nested within that one old regime. More countries are bumping against the nuclear weapons ceiling at the same time as the world energy crisis is encouraging a move to nuclear energy.

There is a gathering sense around the world that nuclear threats are intensifying and multiplying. There is a matching growing conviction that existing policies have failed to mute the threats. In the meantime, scientific and technological advancements since the NPT was signed in 1968 have greatly expanded our technical toolkit for monitoring and verifying weapons reduction and elimination. It is time to supplement and then supplant the sword-and-shield nuclear diplomacy of the United States with the pen diplomacy of a multilaterally negotiated, non-discriminatory and universal nuclear weapons convention.

Restarting a Stalled Agenda

The policy of the nuclear-armed states on nuclear disarmament recalls St Augustine's possibly apocryphal lament: 'O Lord, make me chaste – but not just yet'. Some years ago, a group of people in UNESCO were trying to have peace inscribed as a human right. The American representative at the discussion objected, on the grounds that if peace was declared to be a human right, it would be much more difficult to start new wars. Just so. If nuclear weapons were abolished, nuclear war too would be very much more difficult to start.

The highly influential series of articles by four heavyweights from the US strategic policy community in the *Wall Street Journal* (2007–13) gave 'street credibility' to the goal of nuclear disarmament within the US political process, and political legitimacy to it worldwide. The nuclear agenda was re-energized with the Prague promise of President Barack Obama in April 2009 to aim for the peace and security of a world without nuclear weapons. Russia and the US negotiated, signed, ratified and have brought into force New START to cut back their deployed (but not total) nuclear arsenals by one-third.

Yet there is a palpable and growing sense that New START might mark the end of nuclear accomplishments instead of being the first step on the road to abolition – and the mood of pessimism can only deepen after the crisis in Ukraine. There is little evidence of significant domestic political constituencies in the nuclear-armed states to get disarmament back on track. Tellingly, not one country that had the bomb in 1968 when the NPT was signed has given them up 46 years on. Indeed judging by their stockpiles, modernization/upgrade plans and programs, deployment practices, and doctrines, all nuclear-armed states are determined to retain their weapons status indefinitely and are contemplating expanded use of these weapons for several decades ahead.

To would-be proliferators, the lesson is clear: nuclear weapons are indispensable in today's world and for dealing with tomorrow's threats.

A good example of a Cold War nuclear legacy posture is weapons held on high alert. The security environment of the 21st century is starkly different from the Cold War period, but the nuclear force posture is still trapped in the old paradigm with some 2000 nuclear warheads kept at high readiness to be launched en masse before the apprehended arrival of incoming enemy missiles. According to the Cartwright study for Global Zero (2012), US early warning teams will have up to three minutes to determine that indications of an incoming nuclear attack are real and report to the president; the president would have a maximum of twelve minutes to decide whether to retaliate in kind or risk decapitation of nuclear command and control capacity and decimation of US nuclear forces; missile launch crews in underground command posts and submarines would have two and twelve minutes respectively to take the

missiles out of their silos and tubes and launch them on their 30 minutes (or less) flight path to enemy targets.

Like nuclear terrorism, the launch of nuclear weapons on high alert by mistake, miscalculation or through a malfunction is low probability but high impact. In the tense environment of nuclear decision-making, high alert weapons carry a fourfold risk of unnecessary nuclear war:

- Accidental launch (technical failure caused by malfunction);
- Authority to launch being usurped by a subordinate official or by terrorists (custody failure leading to rogue launch). Although the least likely, the risk of unauthorized use increases in the middle of a crisis dispersion of nuclear weapons and in the case of countries like Pakistan whose organizational and technical safeguards may be brittle rather than robust;
- Misinterpretation of incoming warning data (information failure leading to miscalculation);
- Premature and ill-judged response to an actual attack (miscalculation caused by decision-making failure in a crisis).

Taking nuclear warheads and systems off high alert can deepen the stability of nuclear deterrence. Anything that lengthens the decision-making fuse such that there is a significant extension of the timeline – from the first report of an incoming threat, to a decision to use a nuclear weapon, then the actual launch of the weapon – can only add to the existing tight margins of security from nuclear weapons.

Civil Society and the Humanitarian Consequences of Nuclear Weapons

The Ottawa treaty offers us an example of a convention banning an entire class of weapons, already in wide deployment, as a result of a coalition of NGOs and like-minded civic governments highlighting its humanitarian consequences over its military utility. Only governments can set authoritative standards, establish duly recognized international norms and negotiate treaties. But NGOs have a crucial role to play in promoting global norms, monitoring state compliance with agreed commitments, and reflecting community values and concerns that do not always find expression in governmental processes. Several regional NWFZs too have their origins in NGO advocacy and grassroots campaigns.

The most productive way forward for committed states and NGOs to generate political momentum for the nuclear disarmament cause may be to emphasize the catastrophic humanitarian consequences of any use of nuclear weapons. This was the primary motivation for the challenge to the legality of nuclear weapons mounted in the World Court which resulted in the 1996 advisory opinion concluding that their use was indefensible except, possibly, in self-defence when a state's very survival was at stake.

The 2010 NPT Review Conference expressed 'deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons, and reaffirm[ed] the need for all states at all times to comply with applicable international law, including international humanitarian law'. In October 2012, Switzerland read out a joint statement at the UN on behalf of 34 countries: the 'catastrophic humanitarian consequences' of any use of nuclear weapons 'concern the community of states as a whole'. Under no circumstances must they ever be used again. 'The only way to guarantee this is the total, irreversible and verifiable elimination of nuclear weapons, under effective international control'.

A key message from the first humanitarian consequences conference in Oslo in March 2013 was that no country or international body has the capacity to address the immediate

humanitarian emergency caused by a nuclear weapon detonation or provide adequate assistance to victims. Last October, speaking at the UN on behalf of 123 countries and the Holy See, New Zealand noted that the broad participation at the March 2013 Oslo Conference, with attendance by 128 States, the International Red Cross, and several UN and civil society humanitarian organizations, reflected the recognition that the catastrophic humanitarian consequences of nuclear weapons are a major global concern. However Australia issued a parallel statement on behalf of 17 countries, mainly those who shelter under the US nuclear umbrella (Belgium, Canada, Germany, Italy, Netherlands, Poland, Spain, Turkey, etc) that emphasized 'both the security and the humanitarian dimensions of the nuclear weapons debate'. (Japan signed both statements.)

The second conference on the humanitarian impact of nuclear weapons was held in Mexico last month. (Austria is scheduled to host the third later this year.) All the NWS boycotted both Oslo and Mexico (Britain and the US reportedly were in favour of taking part in Mexico but stayed away to maintain P5 solidarity), and many allies sheltering under extended nuclear deterrence have attended but pressed for engagement with the NWS and dilution of the humanitarian impact statements. These allies are far more forceful and robust in protesting the risks of nuclear non-proliferation and markedly more timid in demanding concrete disarmament from their protectors, just like the Western allies are volubly insistent on Iran's non-proliferation obligations but silent on Israel's undeclared nuclear arsenal. The momentum building up behind the humanitarian impact movement is proving to be embarrassing to them and a diplomatic irritant to the NWS.

Moving Forward

Nuclear weapons are the common enemy of humanity. Like chemical and biological weapons of mass destruction, nuclear weapons too cannot be disinvented. But like them, nuclear weapons too can be controlled, regulated, restricted and outlawed under an international regime that ensures strict compliance through effective and credible inspection and verification. Japan is the *emotional* touchstone in the discourse as the world's only victim of the bomb. The *circuit-breaker* in the countervailing nuclear-weapons capability spiral is the United States. It has a special responsibility to light the way to nuclear abolition as the only country to have used them and as the world's biggest military power. If its case to retain the bomb is persuasive, then by all objective analysis it should be even more persuasive for those countries that live in insecure neighbourhoods and lack the panoply of conventional military tools, underpinned by technological primacy, available to Washington. By destroying its nuclear stockpile, Washington would prove that national security can be safeguarded without nuclear-weapons capability.

Conversely, the spread of nuclear weapons to other countries would erode the US primacy as the world's dominant power and multiply the number of potential trouble spots where it might be required to intervene. A zero option that destroyed the infrastructure of the nuclear weapons industry would be far easier to police even against non-state groups. The best way to keep nasty weapons out of the hands of nasty groups is to keep them out of the hands of governments, including good governments.

What we need is a multi-phased roadmap to abolition that prioritizes concrete immediate steps in the first few years, like introducing more robust firewalls to separate possession from use of nuclear weapons; further significant cuts in existing nuclear arsenals and a freeze on production of fissile materials in the medium term; further constraints on the deployment of their nuclear weapons on the territories of other states, for example by means of regional NWFZs; and an enforceable new international nuclear weapons convention that requires total and verified destruction of all nuclear stockpiles within our lifetime.

Implementing Article 6 of the NPT instead of dusting it off occasionally as a rhetorical concession would dramatically transform the NPT into a prohibition regime. Because the NPT has been subverted into a non-proliferation regime, the time has come to look beyond it to a cleaner alternative that gathers all the meritorious elements into one workable package in a nuclear weapons convention. This will not self-materialize merely because we wish it so. Nuclear abolition is both desirable and feasible. But there are many technical, legal and political challenges to be overcome. Nor will it ever eventuate if we always push it to a distant future. Serious preparatory work on it needs to be started now, with conviction and commitment.

Those who worship the most devoutly at the altar of nuclear weapons issue the fiercest fatwas against others rushing to join them. The most powerful stimulus to nuclear proliferation by others is the continuing possession of the bomb by some. It is difficult to convince others of the *futility* of nuclear weapons when all who have them prove their continuing *utility* by insisting on keeping them. The threat to use nuclear weapons, whether to deter their use by others or to prevent proliferation, legitimizes their possession, deployment and use. That which is legitimate cannot be stopped from proliferating. Hence the axiom of non-proliferation: as long as any one has them, others, including terrorists, will try their best (and worst) to get them.

Those who dismiss this as naive – a utopian dream – must confront a stark reality. In the real world, the only choice is between nuclear abolition, or cascading proliferation with several countries acquiring nuclear weapons. The notion, that a self-selecting group of five countries can keep an indefinite monopoly on the most destructive class of weapons ever invented, defies logic, common sense, and all human history. Critics of the zero option want to keep their bombs but deny them to others. They lack the intellectual honesty and courage to show how non-proliferation can be enforced without disarmament, to acknowledge that the price of keeping nuclear arsenals is uncontrolled proliferation, and to argue why a world of uncontrolled proliferation is better for national and international security than abolition.

As part of a forward-looking agenda, the **United States and Russia** could initiate negotiations for a new treaty to reduce stockpile numbers for all classes of weapons, significantly cut back on their 2,000 warheads held in high alert status, and embrace the principle of 'no first use' in their nuclear doctrines. **Washington** could also address Chinese and Russian concerns about ballistic missile defence and prompt global strike capabilities. The **US, China, India and Pakistan** could move to rapid ratification of the CTBT with the last three not holding their ratification conditional to US. **China, India and Pakistan** could freeze their nuclear capabilities at present levels and Pakistan could helpfully lift its veto on negotiations for an FMCT. **India and Pakistan** should avoid destabilizing steps like the development of battlefield tactical nuclear weapons and missile defences. Finally, **US allies, including Australia and Canada**, could accept a significantly reduced role for nuclear weapons in their security protection, in particular by accepting and clearly stating support for the US declaring that so long as nuclear weapons exist, the 'sole purpose' of its nuclear weapons is to deter their use by others. None of these steps would jeopardize the national security of the country concerned; each would make the world a little bit safer; all together in combination would make the world much safer for everyone.

The NPT anomalies and flaws mean that we need to look beyond and perhaps outside the treaty to realize the goal of nuclear elimination. But its very real and substantial contributions to international security mean that we must not jeopardize the regime until we are ready to replace it with a better and robust regime. If the non-proliferation end of the NPT bargain collapses, the regime will become obsolete. If the Article 6 disarmament goal of the NPT is realized, the regime becomes redundant.

In the journey to a post-NPT world in which all nuclear weapons have been eliminated and their associated infrastructure have been destroyed under a universal and verifiable nuclear weapons convention, we have to guard against another two critical risks. First, at present a significant number of countries shelter under the nuclear umbrella of others to meet their perceived national security needs. With any hasty or premature dismantlement of the US nuclear stockpile, one or more of them could be tempted into breaking out and acquiring an independent nuclear weapons capability. Second, in moving towards a world without nuclear weapons, we have to make sure that we do not tip back into a world that is once again safe for major-power conventional wars like the First and Second World War.

Conclusion

The case for nuclear abolition is simple, elegant and eloquent. Without strengthening national security, nuclear weapons jeopardize international security and diminish our common humanity. Their very destructiveness robs them of military utility against other nuclear powers and of political utility against non-nuclear countries. As long as any country has any, others will want some. As long as they exist, they will be used one day again by design, accident, or miscalculation. We must make the transition from a world in which the role of nuclear weapons is seen as central to maintaining national and international security, to one where they become progressively marginal and eventually unnecessary.

The barriers against the acquisition, spread and use of nuclear weapons include legal conventions, norms and the fact of their non-use for almost 70 years. But the focus on non-proliferation to the neglect of disarmament ensures that we get neither. The problem is not nuclear proliferation, but nuclear weapons. They could not proliferate if they did not exist. Because they do, they will. The very fact of their existence in the arsenals of nine countries is *sufficient guarantee* of their proliferation to others and, some day again, use. Conversely, nuclear disarmament is *a necessary condition* of nuclear non-proliferation.

The policy implication of this logic is that the only guarantee of nuclear non-proliferation is nuclear disarmament. If we want non-proliferation, we must prepare for disarmament. Within our lifetime, either we aim for controlled nuclear reduction and abolition or we learn to live with slow but certain nuclear proliferation and die with the use of nuclear weapons.

Confronted with a world we cannot change, reasonable men and women adapt their behaviour to the real world. But the turning points in history have come from the efforts of those visionaries who set themselves to change the world instead, from the Buddha to Jesus Christ, Mahatma Gandhi and Nelson Mandela. The walk to freedom from fear of nuclear weapons may prove to be very long indeed, but we must neither step off the path nor stop short of that destination.

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Nuclear weapons lead to, what is popularly referred to as, "Mutually Assured Destruction" or MAD. In this modern world's international political scene, nuclear power means political or a great negotiation power. Obviously, if one nation has nuclear weapons and none of the other nations do, then they are at a disadvantage. This awful situation leaves the other helpless nations defenseless to any kind of attacks, interventions, or abuse by the more powerful nations. These groups are mainly the cause of many political problems in countries from Latin America and Africa. Nuclear weapons are totally obsolete and unable to meet today's challenges. On the contrary, far from maintaining peace, they fuel fear and distrust between countries. 3) Nuclear weapons cost us a fortune. Greenpeace "NO WAR" hot air balloon at a demonstration against the Iraq war in Berlin. © Paul Langrock / Greenpeace. While nuclear arsenals have decreased since the mid-1980s, the budgetary expenditure related to nuclear weapons is constantly on the rise. This pattern of spending of public money is found in all states which possess nuclear weapons. According to estimates (Global Zero, 2011) it's close to \$1000 billion for the decade of 2010-2020. What will the spread of nuclear weapons do to the world? I say "spread rather than proliferation" because so far nuclear weapons have proliferated only vertically as the major nuclear powers have added to their arsenals. Horizontally, they have spread slowly across countries, and the pace is not likely to change much. Short-term candidates for the nuclear club are not very numerous, and they are not likely to rush into the nuclear military business. Nuclear weapons will nevertheless spread, with a new member occasionally joining the club. Counting India and Israel, membership grew to seven in the first 35 years of the nuclear age. A doubling of membership in this decade would be surprising.