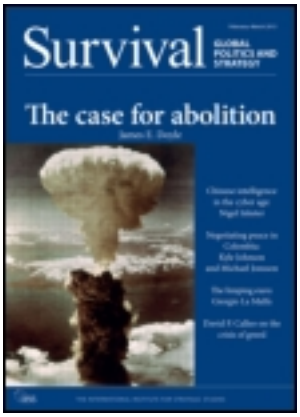

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Why Eliminate Nuclear Weapons?

James E. Doyle

On 5 April 2009 in Prague, US President Barack Obama asserted the United States' commitment to 'seek the peace and security of a world without nuclear weapons'. He was adding his voice and the efforts of his administration to the growing number of world leaders, citizens and civil-society organisations seeking the elimination of such weapons.[1] Banning the bomb has been a passionate and often popular crusade since its creation and first use, but in all that time it has never been a serious strategic objective for any state that possessed nuclear weapons.[2] Why would a sitting US president take the political and strategic risk of declaring that progress towards this goal was a key element of America's national security policy?

There is no simple answer. A vast and complex set of interests, issues, theories, experiences and beliefs influences individual and national views on nuclear weapons, views that span the range of practical, political, moral and psychological understanding. Some recent arguments for eliminating nuclear weapons cover new ground and derive from the belief that the twenty-first-century global security environment differs fundamentally from that of the Cold War. Some proponents claim that historical changes have undermined the ability of nuclear weapons and deterrence to provide security benefits to most nations. Others challenge earlier calculations of the value of such weapons and assessments of the balance between the risks and benefits of a strategy of nuclear deterrence.

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Moreover, recent scholarship in the fields of history and deterrence theory questions deeply held beliefs regarding how nuclear weapons might influence the behaviour of national decision-makers. For example, declassified official documents from the Cold War reveal occasions when nuclear catastrophe was avoided by luck or seemingly random events rather than by the clearly identifiable operation of nuclear deterrence. There are further examples where existential characteristics of alerted nuclear forces appear to have caused crises that nearly resulted in their use. Finally, a growing number of strategists and technical and political elites regard nuclear weapons and deterrence theory as anachronistic. Some view the whole idea of nuclear weapons as out of step with today's global threats, understanding of power and notions of human rights and the rule of law. Emerging structural changes in the international system (such as globalisation) undercut traditional theories of nuclear deterrence, while trends in information technology make possible much more agile and discriminate forms of military power. These arguments dovetail with others that assert that our greater understanding of the Earth's environmental systems and humankind's interdependence with those systems has made eliminating nuclear weapons more salient. A quite limited exchange of nuclear weapons against urban areas could trigger or accelerate global climatic catastrophe (cooling rather than warming), leading to the deaths of millions who had been uninvolved in the conflict itself. Many citizens, scientists and laymen alike, view nuclear-weapons abolition as an essential milestone in the development of human civilisation, a moral, ideological and practical campaign that could catalyse the transformation of international relations and improve the outlook for civilisation at a critical time.

Humanity stands at an historic juncture, facing multiple interconnected threats within a compressed timescale. Besides the potential use of nuclear weapons, these include environmental degradation, resource scarcity, climate change, overpopulation, global disease pandemics, financial crises and natural disasters. The sort of international cooperation needed to reduce the number of nuclear weapons is similar to that needed to address these other transnational threats. Elimination of nuclear weapons would

at least symbolically improve the chances of successfully addressing other existential threats.

Obama, and others who seek a world without nuclear weapons, are right. Eliminating nuclear weapons is profoundly in the national-security interest of the United States and its allies and friends. Without major progress towards the elimination of nuclear arms, moreover, it is unlikely that the world will be able to avoid nuclear use for a prolonged period or respond adequately to security challenges related to climate change, resource scarcity and environmental degradation. The international community must reject the myths and expose the risks of the ideology of nuclear deterrence if it is to successfully meet the mutual global challenges of the twenty-first century.

Challenging myths

The United States and the other nuclear-armed nations have long maintained the threat of nuclear retaliation to deter acts of aggression against them. During the hostile ideological conflict of the Cold War, strategists on both sides concluded that only the prospect of mutually assured destruction would instil prudence and prevent decision-makers from issuing political or military challenges that bore a high risk of leading to military conflict.[3] The strategy of nuclear deterrence was adopted in the West, reluctantly, as the least bad choice for managing what was believed to be an all-out struggle with Soviet Communism for domination of the planet and the social and political ideology of humankind. The 'balance of terror' and 'mutually assured destruction' (MAD) were not desirable strategies; they were viewed as the best that could be achieved given the circumstances of the Cold War. This was despite universal agreement that an exchange of nuclear attacks in response to aggression would inflict unprecedented damage on the citizens and territory of a nation.[4] The use of nuclear weapons on the Japanese cities of Hiroshima and Nagasaki in 1945 embedded the overwhelmingly destructive nature of the bomb deeply into the collective psyche. Given no clear alternatives, national-security elites accommodated themselves to the paradox of nuclear deterrence and devised complex theoretical formalisms

Deterrence was adopted reluctantly

claiming that the risks of such a strategy were manageable and acceptable. In the world of nuclear deterrence, strategists were reconciled to the fact that, in order to be safe, you had to be willing to be crazy. As Winston Churchill put it in 1955, safety would 'be the sturdy child of terror and survival the twin brother of annihilation'.[5]

The world of 2013 is dramatically different, and it will change even more profoundly in the decades ahead. The question today is whether a strategy based on nuclear deterrence continues to be the most effective way for governments to deal with international tensions and protect themselves, or whether alternative strategies with greater benefits and lower risks are available. The answer depends in part on how our understanding of nuclear deterrence has evolved and whether it remains as stable and salient as the majority of the strategic community believed it to be during the Cold War.

Weapons of acceptable risk?

No one doubts the catastrophic consequences of nuclear war. The rapid destruction of even a small number of major urban areas in any nation would bring unprecedented devastation and loss of life. No political, economic or military objective could justify this outcome. Nor does anyone believe that any human or technological device, system or tool will operate forever without failure or error. Yet we accept the risk of nuclear war that accompanies reliance on a strategy of nuclear deterrence because we perceive that risk to be low and because no mainstream school of strategic thought is promoting an alternative.

The concept of risk includes the relationship between the consequences and probability of an event. If the consequences of an event are extremely negative, such as the devastation resulting from nuclear war, then you want the probability of the event occurring to be vanishingly small, as close to zero as possible. But the questions of the probability of nuclear war and what factors cause changes in this probability over time have seen little scientific or scholarly analysis. This is a glaring omission in strategic discourse. We know that nuclear deterrence can fail, either through poor decisions, escalation during a crisis, a series of mechanical and human errors, or malicious acts

that lead to inadvertent use.[6] It has nearly failed several times, the most famous example being the 1962 Cuban Missile Crisis.

A chain of events leading to nuclear war can emerge even when no political leader believes it is in the interest of the state to initiate war, and both sides act in a manner intended to avoid it. The long list of nuclear accidents, malfunctions, mishaps, false alarms and close calls, often initiated by mechanical and human error, continues to grow. Such incidents include crashes of nuclear-armed aircraft and submarines, warning systems mistaking flocks of geese or reflections of sunlight for enemy missile launches, maintenance crews dropping tools and blowing up missile silos, and the temporary loss or misplacement of nuclear weapons.[7]

In 2002 it was revealed that two episodes during the Cuban Missile Crisis had brought nuclear war much closer than had been previously realised. On 26 October 1962, the destroyer USS *Beale* tracked and dropped small charges (the size of hand grenades) on a Soviet submarine to signal it to surface. Unknown to the US Navy, the submarine was armed with a nuclear torpedo with a 15-kilotonne warhead. Running out of air, the Soviet vessel was surrounded by American warships and desperately needed to surface, but was also considering defending itself. The captain ordered the arming of the nuclear torpedo, and the political officer concurred. Fortunately, the submarine brigade commander was also on board; he overruled the captain and defused the threat of a nuclear attack on the American fleet that would have almost surely brought on a nuclear response.

The captain ordered the arming of a nuclear torpedo

The US military and intelligence services, too, were unaware that Soviet nuclear warheads for tactical missiles had already arrived in Cuba by September 1962. The shorter-range systems were operational by the time President John F. Kennedy was considering military action to destroy the missile bases in October. Based on incomplete knowledge, his military advisers considered the chances low that US conventional attacks on the Cuban missile sites would escalate to nuclear war. But they were unaware that the local Soviet commanders of the tactical-missile bases had been given

the authority to launch their missiles if attacked. If US air-strikes had been ordered, as several high-ranking military leaders recommended, it is very likely that a nuclear exchange would have followed, potentially escalating to direct attacks on US and Soviet cities.

The risk of deterrence failure remains significant. Nuclear deterrence is a complex, tightly coupled system. It is vulnerable to the unpredictable and uncontrollable nature of human error, mechanical failure and accident.[8] If it fails, as nearly all such systems eventually do, it is likely to fail catastrophically and cause unprecedented human suffering. The American public (and the citizens of other nuclear-armed states) should demand that their governments conduct probabilistic risk assessments of scenarios that could result in the use of nuclear weapons.[9] The nuclear, chemical, health and transportation industries are required to use this science to justify the safety of many actions and products and demonstrate that risks have been systematically identified and accounted for. Why should we demand less of the institutions we trust with our defence? Without an attempt to determine the probability of deterrence failure under variety of postulated scenarios, it is impossible to conduct a rational risk–benefit assessment of maintaining nuclear deterrence as a key element of national-security strategy.

Weapons of peace and strength?

Following the use of nuclear weapons against Japan, and in the absence of nuclear war between nuclear-armed nations, a powerful belief in the strategic benefits of nuclear weapons emerged. A central pillar of this belief was the assumption and assertion by most observers in the West that the US atomic bombings were the decisive factor in Japan's decision to surrender. This allowed the claim that the use of atomic weapons actually saved tens, if not hundreds, of thousands of American and Japanese lives by ending the war without the need to invade the Japanese Home Islands. Supporters of nuclear deterrence also claim that it has proved to be one of the most effective tools ever devised to avoid warfare between major states.[10] This belief is understandable, given the frequency of conventional war prior to the development of nuclear weapons and the relative absence of direct warfare between major powers after they acquired nuclear arms. The

national-security elite of many nations has embraced these two views, that nuclear weapons can be decisive in conflict and can prevent conflict from occurring. Indeed, they have become canons of strategic thought, though curiously much more so among civilian defence experts than among military professionals who might be called on to the use the weapons.

Recent scholarship has challenged both the logic and historical accuracy of arguments supporting the efficacy of nuclear weapons in the war against Japan and the view that nuclear deterrence is the leading cause of the absence of great-power war since 1945.[11] For example, there is an emerging view among historians that the entry of the Soviet Union into the Pacific War on 9 August 1945 was more decisive in Japan's decision to surrender than the threat of further atomic bombings. Japan was already largely defeated and lacked the armed strength or industrial capacity to fight a two-front war. The conventional bombing of Japanese cities had inflicted similar or greater devastation than the atomic bombs but had failed to prompt surrender. Moreover, careful analysis of the correspondence and behaviour of the Japanese leadership reveals a stronger reaction to the Soviet declaration than to the atomic bombings.[12]

Nor did nuclear weapons end interstate conflict, even between nuclear powers. The specific causes of the absence of major war on the European continent or between the United States and the Soviet Union from 1949 to 1991 cannot be known. But a disciplined thought experiment into the most likely causes of this relative calm would seek evidence that there was indeed an intent to use military force on the part of a state facing a nuclear power and that leaders failed to employ force because of their fear of nuclear war. Such evidence is scarce, especially outside the context of crises generated by accidents and misperceptions between great powers, which continued despite the presence of nuclear weapons. Moreover, during those crises the existence of nuclear weapons escalated the level of tension and put decision-makers in situations where the probability of miscalculation and human error was increased. This raises the possibility that the traditional view of nuclear deterrence as a crisis stabiliser may be incorrect.

Another approach to investigating the role that nuclear weapons may have played in the Cold War calm would be to control for other plausible

explanations of war-avoidance during the period. Could a lack of intent to use military force for less than vital national objectives be a significant cause of the peace? How about an aversion to the devastating consequences of major conventional war by leaders and citizens, many of whom had experienced it twice in their lifetimes?[13] Finally, can one dismiss completely the notions that major war became less likely as a result of shifts in the political orientation of national governments, growing economic and cultural interdependence, or advances in information, life-sciences and environmental technology? Certainly it is plausible that regional security alliances, ongoing East–West security dialogues and the evolution of European integration played a role in avoiding a third world war.[14] These alternative explanations have not been exhaustively explored and they cannot be dismissed. That Western scholars and strategists since the Cold War have largely neglected them is unfortunate. This is not to say that nuclear weapons played no role in keeping the peace, but it is reasonable to conclude that the absence of major war between states during this period had multiple causes and it is possible that nuclear weapons played only a minor role. Yet no thorough, peer-reviewed scholarly effort has been conducted which attempts to assign and defend accurate weights or degrees of influence that the various causes may have played in the historical outcome.

It is clearly unreasonable to assert that evidence supports the claim that nuclear deterrence was the major cause of war-avoidance. This assertion is a belief, unsupported by anything approaching a strong, clear body of historically documented evidence. In fact, there is little reason to claim that the long peace since the Second World War is any more likely a blessing of the nuclear age than the logical conclusion of a substantial historical process, and one for which, contrary to proponents of nuclear deterrence, there are earlier precedents. Some scholars challenge even the view that the post-war peace is a true historical anomaly that needs any special explanation.[15] The problem with the strength of the belief that nuclear deterrence caused the so-called long peace is that it biases strategic thinking in a way that increases faith in the value of nuclear weapons without firm evidence. This perception of high value increases tolerance for the risks of nuclear deterrence.

The historical evidence that has emerged since the end of the Cold War further weakens the argument that nuclear deterrence was the leading cause of peace. After studying the Soviet Union's political and military archives and interviewing members of the General Staff, scholars have learned that there was never any intent on the part of the Soviet Union to invade Western Europe or attack the United States. Despite the fact that conventional wisdom in the West claimed that the Soviets were working on a nuclear force posture that would enable them to win a nuclear war, the Soviet military leadership actually considered victory to be unattainable in any meaningful sense. According to first-hand interviews conducted after 1991, the Soviet General Staff understood the devastation that would result from a nuclear war and therefore did not develop a working definition of victory.[16] Ironically, but not unsurprisingly, the Soviets perceived the United States to be preparing for a first strike. This predominance of worst-case mirror-imaging, with both sides assuming the other believed it could win, and was therefore likely to start a nuclear war, challenges the claim that nuclear weapons tend to improve communication between adversaries. In the US–Soviet case, it appears that just the opposite was true. Rather than contributing to war-avoidance, it appears that the strategy of nuclear deterrence was largely irrelevant to deterring a major US–Soviet or NATO–Soviet war. Neither side ever saw an advantage in initiating such a conflict in the first place.[17]

There was never any intent to invade Western Europe

In addition to the uncertain contribution made by nuclear weapons to the absence of direct US–Soviet warfare during the Cold War, it is clear they have played a negligible role in the absence of conflict between Russia and the United States for the past 20 years. That peace is much more satisfactorily explained by the lack of fundamental political and ideological conflict and the development of a much greater range of mutual interests between the former adversaries. The low remaining risk of nuclear war between Russia and the United States is due far less to their nuclear deterrent relationship than it is to the inherent dangers of their continued deployment and

operation of alert nuclear forces that are susceptible to accident, theft or inadvertent or unauthorised use.

The contribution that nuclear weapons make today to deterring the most likely threats to the security of the United States and its allies is also dubious. America exists in a world where none of the other states possessing nuclear arms (with the possible exception of North Korea, the strength of whose rudimentary nuclear-weapons capabilities remains unknown) has state goals or conducts a foreign policy fundamentally hostile to the interests of the United States. Today, a terrorist attack is thought to be much more likely than an attack by another state. US nuclear weapons do not deter terrorist attacks. Al-Qaeda has attacked the United States, Great Britain, Pakistan, several NATO countries, and Israeli citizens and interests. Russia has also suffered terror attacks. All these states possess nuclear arms or are in alliance with nuclear powers.

The existence of nuclear weapons in the age of global terrorism creates a very real security liability for all states. The key uncertainty in the current security environment is not whether nations will be attacked by terrorists and non-state actors but whether such actors will acquire the means to move from conventional to nuclear explosives, making their inevitable attacks of much greater consequence. To prevent nuclear attack by terrorists and sub-state actors, states must successfully devise a strategy of denying them the ability to acquire nuclear weapons. Current strategic trends run counter to this objective. More nuclear-weapons materials are being produced, more knowledge relevant to the construction of nuclear weapons is being dispersed, and terrorist organisations are becoming more interested in acquiring nuclear capabilities.

The priorities and requirements of this approach are vastly different from a nuclear deterrent strategy. Such a strategy of denial places priority on achieving absolute minimal stockpiles of nuclear weapons and materials throughout the world and preventing their spread to other states, because that spread increases the likelihood that terrorists could acquire them. A denial strategy also emphasises the need for the most effective security possible for the nuclear weapons and nuclear materials that do exist. But perfect security for such items can never be achieved. In September 2007, for

example, six cruise missiles armed with nuclear warheads were mistakenly carried on a B-52 strategic bomber from North Dakota to Louisiana, where they sat on a runway for hours without proper security because no one knew they were there.[18] Such incidents highlight the fact that the ultimate objective of a denial strategy is the elimination of all nuclear weapons and weapons-grade fissile materials so that there are none that could fall into terrorist hands. In seeking a world free of nuclear weapons, Obama is also seeking the security of a world with a drastically lower risk of nuclear terrorism.

Weapons of caution and stability?

Another claim made by advocates of nuclear deterrence is that it induces caution during crises, makes leaders more risk-adverse and more hesitant to take military action, and allows the resolution of crises before they escalate into major military exchanges.[19] This is perhaps the hope Churchill had in mind when he said 'safety will be the sturdy child of terror'. Belief in the ability of nuclear weapons to ameliorate historical shortcomings in the war-avoidance skills of national leaders grew during the Cold War as no major war broke out and several US–Soviet crises passed without the use of such weapons. This was accepted as evidence of the benefits of nuclear deterrence.

Khrushchev's decision was reckless

But explanations of war-avoidance during these episodes based on post-Cold War historical research, including first-hand interviews with participants, have little to do with the theoretical operation of nuclear deterrence and much more to do with luck and personal judgement. Former Secretary of Defense Robert McNamara noted that the decision-making process in Washington, as well as in Moscow and Havana, during the Cuban Missile Crisis was characterised by 'misinformation, miscalculation, and misjudgment'.[20]

Soviet Premier Nikita Khrushchev's decision to send to Cuba nuclear missiles that could strike the United States was a reckless, high-risk action, the sort of thing nuclear-deterrence theory predicts would be avoided. The Soviet Union knew by 1961 that the United States considered the Castro

revolution to be a threat to US security and was willing to use military force to support counter-revolution. Moscow had also been informed by the United States that any Soviet transfer of offensive weaponry to Cuba would be opposed. Despite this, Khrushchev and his foreign minister, defence minister and commander of the Strategic Rocket Forces (all of whom understood the potential for nuclear war and its consequences) decided to offer nuclear missiles to Cuba.[21] Adding to the risk of this decision was the manner in which it was implemented. Offensive missiles and 162 nuclear warheads were secretly transported to the island beginning in July 1962. Following growing concern about the intensifying Soviet–Cuban military relationship and the discovery of evidence that nuclear missiles might be headed to Cuba, US Attorney General Robert Kennedy met with Soviet Ambassador Anatoly Dobrynin in Washington on 4 September. Dobrynin told Kennedy that he was instructed by Khrushchev to assure the US side that no surface-to-surface or offensive missiles would be placed in Cuba. The same day President Kennedy made a public statement that 'the gravest of issues would arise' if any offensive missiles were installed in Cuba. Three days later Dobrynin repeated to US Ambassador Adlai Stevenson the Soviet pledge that no offensive weapons were being sent to Cuba. Soviet leaders had to know that their attempted deception of individuals directly involved in crisis decision-making would further raise the stakes and narrow the room for potential negotiation. The discovery of the deception was sure to add anger and personal betrayal to the atmosphere of objective crisis, making compromise or movement towards re-establishing even the slimmest element of mutual trust more difficult.

Examples of Cold War misjudgement, misperception and poor communication are not limited to the Soviet side and did not stop after the Cuban Missile Crisis. In November 1983, US leadership and intelligence services failed to grasp the true extent of Soviet anxiety regarding events surrounding a NATO command exercise code-named *Able Archer*. The Soviet Union began preparations for a nuclear attack on the United States because its leaders believed they had persuasive indications that Washington was on the verge of launching a surprise nuclear attack against them. The clearest evidence of the failure of the US side to realise how genuinely alarmed the

Soviets were regarding the possibility of a US–NATO first strike was the decision to add new features to the annual *Able Archer* exercise in November 1983, including participation of the US president and vice president and simulated communications with the UK and NATO command in a practice drill that took NATO forces through a full-scale simulated release of nuclear weapons against the Soviets.

According to US intelligence sources, on the night of 8 or 9 November KGB headquarters sent a flash cable to its intelligence officers in Western Europe advising them, incorrectly, that US forces in Europe had gone on alert and that troops at some bases were being mobilised. The cable speculated that the alert might be the beginning of a countdown to a surprise nuclear attack. According to Soviet and CIA sources, Soviet nuclear-capable aircraft in Poland and East Germany were placed on high alert status in response. In the following days the Soviets realised that there had been no actual alert of NATO forces, but they remained deeply concerned about US intentions and America's potential to deliberately initiate a major war.

Deterrence theory claims that the fear of nuclear devastation motivates military planners and political leaders to exercise caution and seek an accurate understanding of a nuclear rival's intentions. The events surrounding *Able Archer* clearly cast doubt on this claim. The United States and its NATO allies either misperceived the Soviet sense of insecurity or deliberately ignored it. Had they been aware of Soviet fears and eager to moderate them, it is doubtful that some of the more alarming features such as the nuclear release drill would have been included in *Able Archer 83*.

Underappreciated risks and costs

It appears that the war scare that culminated with *Able Archer 83* was a case of mutual intelligence failure and leadership misperception, shortcomings that remain all too frequent in the post-Cold War era. The fact that it happened 33 years after the beginning of a nuclear deterrent relationship between the United States and Soviet Union and brought the chance of nuclear war closer than at any time since the Cuban Missile Crisis is evidence against the so-called benefits of nuclear deterrence on national decision-making. What if there are no such benefits? What if nuclear-armed nations are just as

prone to stumbling into war or choosing to use military force as they were prior to the acquisition of nuclear weapons? The fundamental difference then would be the magnitude of risk carried by states that choose to rely on nuclear deterrence. If deterrence fails, millions, or even hundreds of millions of civilians can be killed in less than a day. Without nuclear weapons the consequences of military conflict, even between great powers, would not be nearly as severe. Sustained use of conventional weapons can be devastating, and nuclear weapons could eventually be reconstituted and used, but the time needed for either to happen at least presents an opportunity to end hostilities before cities are destroyed.

Nuclear weapons also inhibit the development of positive relations between former rivals, as the unsteady progress in the development of positive US–Russian relations since the end of the Cold War demonstrates. How deeply can two nations engage as partners while still proclaiming the capability and willingness to destroy one another, just in case? To be sure, sources of tension other than opposing nuclear forces exist in the US–Russian relationship, but fundamental change would be needed in the area of nuclear strategy before a true partnership could be established. In the years ahead, the value of a true security partnership with Russia and China for both the United States and Europe is likely to be very high indeed.

The force is too big

Current US nuclear posture with respect to Russia seems to be completely out of step with declared policy. In 1994, Russia and the United States reached a bilateral de-targeting agreement which stated that 'for the first time since the dawn of the nuclear age – Russia and United States will not operate nuclear forces, day-to-day, in a manner that presumes they are adversaries'.[22] But if Russia is not presumed to be a potential adversary, three fundamental features of the current US nuclear force structure and operating posture make little sense.

Firstly, the force is too big. Without the need to target Russia's strategic forces there simply are not enough plausible aim-points in the world for US nuclear weapons that would require 1,500–2,000 operationally deployed warheads. For example, in an extreme crisis, perhaps 50–100 nuclear weapons

at most would be needed to threaten devastation on Iran, North Korea or China. Only Russia's large and dispersed nuclear force has historically justified US forces totalling thousands of nuclear weapons. Secondly, there would be no need for alerted weapons. No country other than Russia has the capability to pre-empt the launch of US forces by destroying a significant portion of them on the ground. Thirdly, US nuclear weapons would not need the operational capability (in terms of accuracy and destructive yield) to limit damage to the United States by destroying Russian nuclear weapons at their protected bases before they could be launched.

The inability of the United States and Russia to make more rapid progress on reducing nuclear weapons and increasing transparency regarding the roles and missions of remaining weapons has created a source of continued misperception and mistrust. America's maintenance of large alerted nuclear forces, even as it develops strategic missile defences, naturally leads Russia to question America's strategic intentions. Russia's retention of thousands of older non-strategic nuclear weapons raises similar suspicions among the NATO Allies. Given the generally positive nature of the US–Russian relationship, the continued competitive mutual nuclear entanglement hinders the development of truly normalised relations. For example, there is no compelling reason why US and Russian nuclear forces could not be safely decoupled, with each nation building down to their own strategic comfort level. The resulting asymmetries need not create instability as long as the political relationship remains positive.

The problem is that much of the US strategic community continues to perceive Russia as a potential adversary, despite pronouncements to the contrary. This limits their willingness to reduce US nuclear counterforce or damaging-limitation capabilities vis-à-vis Russian strategic forces and causes them to advocate the maintenance of numerically large US forces capable of prompt attacks. Those who support the maintenance of large, accurate, prompt-use nuclear forces claim that they are necessary as a hedge against the possibility of a resurgent hostile Russia. However, recent studies by the Department of Defense conclude that, even if Russia did turn adversarial and increase its nuclear forces in excess of US totals, the survivable capabilities of US forces would continue to provide the ability to

answer a Russian attack with a devastating response.[23] The Pentagon's new national security strategy document asserts that the United States can meet all its deterrent goals with respect to the full range of potential adversaries with a smaller nuclear arsenal than it now possesses.[24]

The continued reliance on large nuclear forces and Cold War-style nuclear deterrence has many costs. There is the cost in terms of hindering positive development of relations with Russia and China. The very risk of deterrence failure and the accompanying constant fear of annihilation impose an immeasurable psychological cost. If deterrence does fail, the resulting human suffering could be unparalleled. There is also a cost to efforts to prevent the spread of nuclear weapons to additional states and non-state actors. Embracing nuclear deterrence encourages proliferation. By concluding that the threat of nuclear use can help states manage a variety of threats to national security and stability, proponents of nuclear deterrence invite other states to seek nuclear weapons to secure similar purported benefits.

Finally, there is the large financial cost of a nuclear deterrent. Maintaining its current arsenal of over 10,000 nuclear warheads costs the United States approximately $31 billion annually. By comparison, the combined US international diplomacy and foreign assistance budget is approximately $39bn per year.[25] Current plans call for the modernisation of US nuclear weapons manufacturing infrastructure and the construction of a new generation of nuclear missiles, bombers and submarines. This will cost hundreds of billions of dollars over the next 20 years. In a prolonged era of fiscal constraint, and with the benefits of nuclear weapons uncertain, this level of expenditure is unjustifiable. But perhaps the greatest cost of continued reliance by most nuclear-armed states on a strategy of nuclear deterrence is that it mischaracterises the sources of danger in today's world and distracts decision-makers from adequately preparing for the most likely future threats.

Strategic oldthink

In the realist tradition of international relations theory, all nations are independent actors trying to maximise their power and security in an anarchical world.[26] Nations initiate armed conflict as a means to advance or protect their interests because they calculate the benefits of using

military force outweigh the risks of doing nothing in a competitive system. Proponents of nuclear deterrence argue that nuclear weapons changed the dynamics of this system by raising the stakes and uncertainties of using military force, making it less likely.[27]

There are many problems with this view. Firstly, states possessing nuclear weapons have continued to use military force in situations that could have led them into conflict with other nuclear-armed nations. Nuclear weapons did not deter NATO from using force in Kosovo in the late 1990s or Russian military action in Georgia in 2008. Moreover, states without nuclear weapons have even attacked those who possess them, an outcome that flies in the face of the claims of deterrence proponents. Nuclear weapons did not deter Egypt and Syria from attacking Israel in 1973, Argentina from attacking British territory in the 1982 Falklands War or Iraq from attacking Israel during the 1991 Gulf War.

Secondly, the theory of nuclear deterrence says little about how the roles of nuclear weapons might change in an ever-evolving international system. The nature of threats to individual nations and the stability of the international system have changed dramatically since the introduction of nuclear weapons. Examples of fundamental change include the end of the Cold War and the emergence of large-scale transnational terrorism. Another, more important change is the increased degree of international security interdependence.

Such a strategy is futile

This increased interdependence is clear in the field of economics, but it has also been highlighted by advances in our scientific understanding of the interaction between the Earth's natural systems and the patterns of modern civilisation. Nothing demonstrates this more clearly than our understanding of environmental science. A nation concerned about the economic, public-health and security consequences of atmospheric pollution, climate change, sea-level rise and diminishing supplies of fresh water can implement laws and policies that drastically reduce its pollution of air and water within its own borders. But such a strategy is futile, because the air above its borders and the water in its rivers and aquifers is well mixed with pollutants from surrounding nations. Only if all nations cooperate to reduce pollution can

any one of them substantially benefit from the effort. The same is true for global disease pandemics and natural disasters. These security threats affect many nations simultaneously and individual national efforts to counter or address them cannot be fully effective.

The interconnectedness of the issues of nuclear deterrence and transnational environmental threats has been demonstrated by two scientists, Alan Robock and Owen Brian Toon, who used computer modelling techniques to simulate the climatic consequences of a regional nuclear exchange between India and Pakistan. Their results show that even with the detonation of nuclear weapons limited to the territories of the two combatants, the smoke and dust raised into the atmosphere by the nuclear explosions would eventually circle the globe, killing crops and temporarily cooling the planet. Robock and Toon project that nearly a billion people would die, the vast majority civilians in nations outside the warring states.[28] The implication of this analysis is that all countries have a direct security interest in preventing nuclear war, anywhere. It would be perfectly reasonable for the US joint chiefs of staff to advise the secretary of defense and White House that in order to protect the security of the US population, the Pentagon must have the ability to forcibly prevent nuclear war between India and Pakistan, or any other two countries. This means that no matter what the reason for the war, or who initiated hostilities, the security of the United States would demand that Indian and Pakistani nuclear weapons be destroyed in flight or preemptively attacked on the ground before they could be detonated and cause a global climatic catastrophe that would kill thousands of Americans.

The US military and much of the broader national-security community have recognised the seriousness of transnational threats such as global climate change. The US Department of Defense, for example, included climate threat as a key pillar of its most recent Quadrennial Defense Review and the CIA has established a Center for the Study of Climate Change. Despite this growing awareness, the response remains inadequate and the mechanisms for effective cooperation on transnational threats remain underdeveloped.[29] If we fail to slow climate change or successfully adapt to its consequences, political and military crises are likely to result.[30] Nuclear

deterrence will be meaningless in these crises. Threats to use nuclear weapons will lack credibility because carrying them out would greatly worsen global environmental damage and its consequences for all states, including those who used nuclear weapons in an attempt to defend themselves or defeat their rivals.

A teachable moment

The destructive power of nuclear weapons can create an opportunity for a teachable moment unique in the history of human civilisation. The universal threat of nuclear war marks civilisation's passage of a major milestone and reveals a fundamental truth of the modern international security environment. Technologically advanced nations have gained and will forever now possess multiple means to destroy one another. The number of nations with these capabilities will inevitably increase as technical knowledge and skill spread across the globe. Nuclear weapons may be only the first example of such a capability. New and more devastating means of human destruction may constantly appear as science and technology advance.

We must learn that the greatest meaning of the nuclear revolution is that every government facing a nuclear-armed rival has been forced to conclude that 'my adversaries' sense of security is now my concern', and integrate that understanding into strategy, force planning and operations.[31] Paradoxically, certain actions that might increase a state's military capability against its rival are in fact contrary to its interests because they could panic that competitor into initiating nuclear war. This need to take the perceptions of an enemy into account and accommodate them for the sake of one's own security is transformative.

The nuclear paradox can help us learn by providing clarity for a valuable new understanding: the nearly instantaneous global reach of nuclear weapons and their widespread proliferation crystallises unlike any other human construction the fact that seeking security from a purely nationalist perspective is ineffective and unscientific. The physical, biological and environmental sciences increasingly reinforce this and tell us that there is no such thing as national security, there is only international or collective security. The alternative is collective insecurity.

Nuclear weapons can only have a positive legacy if we learn from them. An international security system based the willingness of nations to commit mutual suicide to protect themselves has always been recognised as a sub-optimum solution to the security dilemma. It is fraught with great risk to the world's nations and peoples and we should be ceaselessly striving for more rational and humane ways to achieve security. Nuclear disarmament has been pursued for more than 60 years and enshrined as a law-backed international goal not because it is the moralistic pipe-dream of the uninformed citizenry, but because many serious practitioners of international statecraft see it as an essential goal of a sustainable international order.[32]

It is not beyond the capabilities of government leaders and institutions to internalise the understanding that major war between modern states can no longer produce security benefits. It is not necessary to continue living with the risks of nuclear deterrence in order reap the cautionary benefits bestowed by the knowledge that modern nations can destroy one another. President Ronald Reagan likened nuclear deterrence based on mutually assured destruction to 'two cowboys in a frontier saloon aiming their guns at each other´s heads permanently'. This is why he concluded that 'nuclear war cannot be won and must never be fought'.[33]

The nuclear taboo

Several scholars have argued that realist or traditional models of state behaviour cannot adequately explain the fact that nuclear weapons have not been used since 1945. They posit that a powerful norm or taboo against nuclear use has emerged. This taboo is based on the tradition of non-use, a growing understanding of the difficulty of achieving military aims with nuclear weapons and a deep moral revulsion to the indiscriminate destruction that nuclear weapons would bring upon human populations and the environment.[34]

That such a taboo exists and has strengthened over the years is indeed an affirmation that the idea of using nuclear weapons in the name of national defence is viewed by most people as morally illegitimate and incompatible with basic human values. It is also welcome evidence of the existence and strength of those values. Unfortunately, many observers regard the nuclear

taboo as a reason to believe that the risk of nuclear war is overblown. They are confident that, despite the vulnerability to unforeseen events and human and mechanical error, nuclear weapons will not be used because controls are adequate, cooler heads will prevail and no leader will want to violate the mores and norms of the nuclear taboo.

Rather than being complacent with regard to existing reliance on nuclear weapons and the attendant risks to civilisation, an effort should be made to nurture and strengthen the taboo and extend it to cover all military conflict among or against nuclear-armed states. There is no compelling reason why governments can't realise that launching major war between nuclear states carries such a high risk of leading to nuclear use that they must, in essence, treat it with equal opprobrium to nuclear use and adopt a taboo against major wars as well. Why do we need the day-to-day presence of the threat of nuclear destruction and the architecture that creates it to benefit from the taboo against initiating Armageddon?

If human civilisation is to survive it must demonstrate that violent conflict between major states is avoidable. This is not a new or radical concept. It is the foundational principle of the United Nations Charter that has been signed by 192 of the world's 195 nations. Reagan said that peace was not the absence of conflict but the ability to resolve conflict by peaceful means.

Like chemical weapons, biological weapons, cluster munitions and anti-personnel landmines, nuclear weapons can be subjected to international regimes that seek to prevent particularly dangerous or inhumane technologies from being used for military purposes. The regimes banning these weapons, while not yet completely implemented, clearly demonstrate that it is possible to eliminate major classes of military technology and make their manufacture and use illegal. Giving up nuclear weapons is neither impossible nor more dangerous than the world we are living in and may indeed lead to a safer world. In essence, the idea of nuclear deterrence based on the threat of mutual destruction, or deterrence with any future indiscriminate weapon of mass destruction, must become universally taboo.

* * *

The view that nuclear weapons needed to be eliminated was articulated as soon as they came into being, and the view that the ideology of nuclear deterrence is incompatible with basic human values and the positive development of human civilisation is also as old as nuclear weapons themselves. Most nations and people view nuclear weapons as a problem, not a solution. At least 30 countries that could build such weapons have chosen not to. Many of the bomb's inventors, including Robert Oppenheimer, were deeply troubled by its potential destructiveness and argued against making it a cornerstone of national security. The vast majority of nations, 189 out of 195, have pledged never to acquire nuclear weapons under the 1970 Nuclear Non-proliferation Treaty.

Nuclear weapons are useless for the most likely challenges

Nuclear weapons should be eliminated because they will not make nations powerful in the twenty-first century and beyond. Their existence in the arsenals of the world creates the possibility of their use and the risks they create outweigh their value. The marginal contribution that nuclear deterrence now makes to the absence of major aggression between great powers is being purchased at too high a price. That price is the constant risk that a complex, tightly coupled and largely automated system subject to normal, systemic and human error will, as science tells us, inevitably fail, and fail catastrophically, with unprecedented and unjustified loss of civilian life. Mistakes with conventional weapons can have limited physical impact. Small mistakes are not possible with nuclear weapons.

Nuclear weapons are useless for confronting and resolving the most likely future international security challenges, but steady progress towards the elimination of such weapons can help nations confront these transnational problems. The diplomatic and technical skills acquired through the creation of treaties and institutions to effectively verify the elimination of nuclear weapons from national arsenals can provide powerful models and experience for addressing other transnational threats. The elimination of nuclear weapons, a project that will require 25–35 years, can thus be an organising principle and set an example for the forms of international

cooperation, laws and institutions that are required to manage other global challenges. Secondly, elimination of nuclear weapons will allow creative, intellectual, technical and financial resources now devoted to nuclear threats to be focused toward the resolution of transnational crises faced by all nations. As nuclear weapons are drawn down those resources can be re-focused toward developing clean energy, carbon-capture technologies, clean water management and low-impact, high-productivity agriculture.

Nuclear weapons should be eliminated because there is a real historic opportunity to do so and because failing to do so will imperil current and future generations as they try to manage a host of inevitable global security problems. Transformation in the way states interact will be necessary before the last nuclear weapons are eliminated, but tangible progress toward nuclear disarmament cannot await the resolution of all international conflict. International conflict existed before nuclear weapons were invented, persists while states possess nuclear arsenals and will remain after nuclear weapons are eliminated from those arsenals.

Obama said in Prague that the elimination of nuclear weapons might not be achieved in his lifetime, but 2045 – 34 years from now, when Obama will be 84 – will mark the 100th anniversary of the atomic bombing of Japan. Three-and-a-half decades is time enough for the world to transition away from the ideology of nuclear deterrence and to dismantle the system of nuclear forces deployed in the name of national defence. Each passing year will bring the need to support Obama's vision of a world free of nuclear weapons more sharply into focus. The international community has the opportunity to honour the memory of the victims of Hiroshima and Nagasaki by eliminating nuclear weapons from the arsenals of the world within a century after they were unleashed.

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Notes

1 See Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic, April 5, 2009, available at http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered. Two major international public efforts to eliminate nuclear weapons stand out: The Nuclear Security Project launched by Sam Nunn, George Schultz, William Perry and Henry Kissinger at http://www.nuclearsecurityproject.org/site/c.mjJXJbMMIoE/b.3483737/k.4057/Nuclear_Security_Project_Home.htm , and the Global Zero Project. For a summary of statements by national governments supporting the elimination of nuclear weapons see http://www.globalzero.org/en/who/governments.

2 See Lawrence S. Wittner, *Confronting the Bomb, A Short History of the World Nuclear Disarmament Movement* (Palo Alto, CA: Stanford University Press, 2009).

3 For classic treatments of nuclear deterrence theory see Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1966) and McGeorge Bundy, 'To Cap the Volcano', *Foreign Affairs,* vol. 48, no. 1, November 1969.

4 For classic information on the consequences of nuclear war see Sidney Drell and Frank von Hippel, 'Limited Nuclear War', *Scientific American*, November 1976; Samuel Glasstone and Philip J. Dolen (eds), *Effects of Nuclear Weapons*, 3rd ed. (Washington DC: US Department of Defense and Department of Energy, 1977; *Effects of Multiple Nuclear Explosions Worldwide* (Washington DC: National Acadey of Sciences, 1975); *The Effects of Nuclear War* (Washington DC: US Arms Control & Disarmament Agency, April 1979); William Daugherty, Barbara Levi and Frank von Hippel, 'The Consequences of "Limited" Nuclear Attacks on the United States', *International Security*, vol. 10, no. 4, Spring 1986, pp. 3–43.

5 Churchill's last speech is entitled 'Never Despair'. It was given to the House of Commons on 1 March 1955 and is available at http://www.winstonchurchill.org/learn/speeches/speeches-of-winston-churchill/102-never-despair.

6 While inadvertent or unintended use by the attacker is not a classic failure of deterrence, its possibility can be regarded as evidence of a vulnerability of deterrent systems. If decision-makers are so rationally averse to nuclear war they should only accept technical systems that have no potential for error or malicious tampering. Unfortunately, such systems do not exist. Furthermore, it will not much matter to the victim of a nuclear attack that it was an accident. The desire to retaliate will be overwhelming and under current doctrine retaliation may even be initiated before the accidentally launched weapons detonate.

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8 See Scott Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993), and Jaya Tiwari and Cleve J. Gray, 'U.S. Nuclear Weapons Accidents', http://www.cdi.org/issues/nukeaccidents/accidents.htm.

9 Martin Hellman, professor of engineering at Stanford University, is a leading advocate of this approach. See Martin E. Hellman, 'Risk Analysis of Nuclear Deterrence', *The Bent of Tau Beta Pi*, Spring 2008, available at http://nuclearrisk.org/paper.pdf . See also Martin E. Hellman, 'Soaring, Cryptography and Nuclear Weapons', 21 October 2008, available at http://nuclearrisk.org/soaring.pdf.

10 See the comments by Bruno Tertrais in 'Nuclear Myth-Busting', correspondence section of *Nonproliferation Review*, vol. 16, no. 2, July 2009.

11 See Ward Wilson, 'The Myth of Nuclear Deterrence', Nonproliferation Review, vol. 15, no. 3, November 2008; John Mueller, *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda* (Oxford: Oxford University Press, 2010); and McGeorge Bundy, 'The Unimpressive Record of Atomic Diplomacy', in Robert J. Art and Robert Jervis (eds), *International Politics: Enduring Concepts and Contemporary Issues* (New York: HarperCollins, 1996), pp. 227–35.

12 See especially Tsuyoshi Hasegawa, *Racing the Enemy: Stalin, Truman, and the Surrender of Japan* (Cambridge, MA: Harvard University Press, 2005); Sumio Hatano, 'The Atomic Bomb and Soviet Entry into the War: Of Equal Importance', in Tsuyoshi Hasagawa (ed.), *The End of the Pacific War: Reappraisals* (Stanford, CA: Stanford University Press, 2007).

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