Until the Sun Grows Cold: Persisting Nuclear Dangers in a Complacent World

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"If science is to bring benefits instead of death, we must bring to bear upon social, and especially international, organization intelligence of the same high order that has enabled us to discover the structure of the atom. To do this effectively, we must free ourselves from the domination of ancient shibboleths and think freely, fearlessly, and rationally about the new and appalling problems with which the human race is confronted by its conquest of scientific power."

Bertrand Russell
"The Bomb and Civilization"
August 1945

Six decades after the fateful first atomic detonation in the desolate desertscape of Alamagordo, New Mexico, the world remains haunted by nuclear risks and dangers. It is now five decades since Bertrand Russell and Albert Einstein issued their famous appeal for a new way of thinking that fully recognizes the grave dangers raised by nuclear weapons. In 1955, a mere decade into the nuclear age, they were driven by a fear that the full implications of the nuclear revolution were not truly understood by publics or by national leaders. The Russell-Einstein Manifesto is most fundamentally an urgent warning, issued by some of the finest scientific minds of the day, that war between nuclear-armed states would be destructive beyond human experience, that such a war could call into view "the risk of universal death." The existence of this profound, species-threatening danger, they urged, called for an equally profound revolution in international politics. If the face of such peril, even eliminating nuclear weapons, though a useful and desirable step, would not be enough; weapons could, after

all, be recreated in times of war. The only truly effective answer to the nuclear danger is the renunciation of war as an instrument of state policy.[1]

"Shall we put an end to the human race; or shall mankind renounce war?" So the Russell-Einstein Manifesto famously asked in 1955, putting before the global public the "stark, dreadful, and inescapable" dilemma facing modern mankind in the era of thermonuclear weapons. The signatories of the Russell-Einstein manifesto believed that the choice was clear: if the magnitude of the peril were properly understood, it would be both necessary and possible to achieve the required revolution in world affairs. Half a century later, we know that this appeal failed. Nuclear weapons have not been eliminated. War has not been renounced. The desired revolution in international politics has not occurred. Though individuals the world over may have been frightened and inspired by the Russell-Einstein Manifesto, leaders and policymakers neither heeded the warning nor accepted the policy recommendations. On the contrary, the leading powers embraced rather than repudiated nuclear weapons, raced to accumulate arms rather than eliminate them, invested heavily in planning how to fight nuclear wars rather than regarding nuclear war as unacceptable, and continued to fight wars rather than renounce war.

Albert Einstein died shortly after signing the manifesto, so one can only imagine how he might have responded to the prodigious nuclear arsenals, numbering tens of thousands of weapons, that were built during the Cold War and how he might have viewed the persistence of armed conflict in the nuclear age. Bertrand Russell, however, left behind an extraordinary short final essay (written several years before his death at 97 in 1970), titled simply "1967," in which he judged harshly both the failure of the world to refashion international politics and his own contributions to world peace.[2] His diagnosis of the challenge posed by the nuclear revolution remained unwavering to the end: "Modern weapons make it practically certain that the next serious war will exterminate the human race." In this judgment he remained faithful to the Russell-Einstein Manifesto. He was no longer so hopeful, however, that there would be significant progress in achieving the recommendations of the Manifesto. Appraising his own life, he concluded – perhaps ungenerously – that he had done "sadly little in view of the magnitude of the evil." Looking unflinchingly at the state of the world, he lamented that "very little" had been done to adapt the world to the nuclear danger. Nearly forty years later, Russell's assessment remains apt: the world has not pursued the course recommended by the Russell-Einstein manifesto.

The warning was unheeded and the recommendations were spurned. And yet, the worst fears have not been realized and the worst dangers have not materialized. It is certainly possible to characterize the decades since the Russell-Einstein

Manifesto as a treacherous passage through fifty dangerous years. Incontestably, there were moments of acute crisis. Nevertheless, the nuclear order that emerged contained, even if it did not eliminate, the nuclear danger. Nuclear weapons and their perils were managed in a world very different from that proposed in the Russell-Einstein manifesto. What has been accomplished? What problems remain? Where do we stand? Half a century after the signing of the Russell-Einstein Manifesto, this is an appropriate moment to take stock of the nuclear realities that confront us. In broad terms, the record of the last fifty years is mixed, with notable accomplishments and notable setbacks and shortcomings. Trends in recent years, however, offer a disappointing and disturbing picture, raising concerns that highlight what is probably the most profound lesson of the Russell-Einstein Manifesto: the need for eternal vigilance in addressing the dangers associated with nuclear weapons.

Nuclear Credits

It should not be forgotten that the nuclear balance sheet over these decades is not wholly negative. Indeed, in some important respects, the record is much better than predicted by the Russell-Einstein Manifesto.

First, and most fundamentally, nuclear use has been avoided since the bombings of Hiroshima and Nagasaki in August of 1945. This is a huge and decisively important accomplishment, one that was by no means inevitable, one that tends to be overlooked and underrated. If we must live in a nuclear-armed world, then preventing the use of these weapons and promoting a norm of non-use is the essential minimum goal, so far successfully achieved. The emergence of a taboo against nuclear use, contrary to the expectations of many in the early years of the nuclear age who believed that nuclear weapons would become "conventionalized," is an important feature of the international landscape, one to be valued and nurtured.[3]

Second, war among great powers – what Russell surely meant in referring to "the next serious war" – has come to seem remote. Even in the mature Cold War period, war between the Soviet Union and the United States seemed unlikely, despite the intense global competition between them. Since the end of the Cold War, the likelihood of a major war seems to have receded still further. Among one group of formerly warring major powers – those of western Europe – war is now said to be unthinkable. No conflict between powerful states seems anywhere near a flashpoint today. And the United States – the lone superpower in this unipolar world – has no clear enemy, only potential rivals none of whom can truly compete with it in the realm of conventional military power.

States and leaders have not renounced war, but at least among the great powers war has been avoided for six decades and appears unlikely. This has surely been a significant factor in keeping the nuclear peace.

Third, many believe (though not all would agree) that nuclear weapons themselves have helped to keep the peace. Through the mechanism of mutual deterrence, nuclear weapons have introduced an element of sobriety and caution in relations between nuclear-armed rivals. The risks and potential costs of major war are so great in a world of nuclear weapons that the benefit of avoiding such war is unambiguously enormous and apparent even to adventurous or bellicose leaders. The ominous warnings of the Russell-Einstein Manifesto about the possibly cataclysmic consequences of nuclear war can only have reinforced the perception that nuclear war involved unacceptable dangers. If nuclear weapons arsenals are to exist, it is certainly desirable that they reinforce peace and discourage reckless behavior.

Fourth, the spread of nuclear weapons to additional states has been unexpectedly limited. The fears articulated in the early years of the nuclear age about the emergence of numerous nuclear-armed states have not come to pass. Instead there has arisen a regime built around the Nuclear Nonproliferation Treaty (NPT) that commands almost universal allegiance among the nearly 200 states in the international system. Dozens of states could possess nuclear weapons today. Instead, remarkably, nearly every state in the system has pledged in a legally binding way to forsake nuclear weapons.

Fifth, arms control has been established as an instrument of statecraft in the management of nuclear affairs. This was an approach that scarcely existed prior to the nuclear age and took years to take root even after the arrival of the nuclear weapon. The several decades beginning with the Limited Test Ban Treaty of 1963 might be said to be the golden age of arms control. Negotiations were a regular feature of nuclear diplomacy. Agreements were reached, rules established, and practices developed that enabled even bitter antagonists like the Soviet Union and the United States to regulate their nuclear relationship and to engage in a surprising degree of uneasy but meaningful collaborative management of the nuclear balance. A network of multilateral arms control measures, including an extensive web of nuclear weapon free zones as well as the NPT, effectively denuclearized much of the planet. At the time of the Russell-Einstein Manifesto, there existed neither serious arms control processes nor any meaningful arms control frameworks to constrain nuclear forces and address nuclear dangers. It was by no means evident at that time that it would prove possible to build restraint into the system by negotiating limits and prohibitions and by engaging in various forms of security cooperation. Though arms control has

often been controversial and has never been universally supported, it appears to be one of the significant and constructive innovations of the nuclear age – one that has contributed to holding at bay the worst scenarios envisioned by the signers of the Russell-Einstein Manifesto.

Finally, there have been a number of successes in coping with nuclear challenges. Over the past fifty years, a number of states have abandoned nuclear weapons programs before building weapons. South Africa acquired nuclear weapons but gave them up. States of the former Soviet Union inherited nuclear weapons when the USSR collapsed, but in every case (Russia excepted) relinquished the weapons on their territories and joined the NPT as non-weapons states. From the perspective of the long term management of the global nuclear order, it is highly desirable that states can and do come to the conclusion that the possession of nuclear weapons is neither necessary nor desirable.

Compared to the bleak fears expressed by the Russell-Einstein Manifesto, the record since 1955 contains a number of significant reassuring elements. The ghastly nuclear disaster has not happened, nuclear weapons have not been used in anger, conflict has been limited and contained, the spread of nuclear weapons has been quite extremely slow and modest, the rise of arms control has introduced an element of management and regulation in nuclear affairs, and there have been a number of successes along the way. It is easy to become preoccupied with nightmares and negatives and to lose sight of the more hopeful dimensions of the big picture. Humankind has survived six decades of the nuclear age without disaster.[4]

Nuclear Debits

The record of the past, however, in no way guarantees a safe future. Despite the significant elements on the positive side of the nuclear balance sheet, nuclear perils remain and the current nuclear agenda is overpopulated with worrying problems. It is possible that a survey of the past could lead to the conclusion that a durable and reliably effective framework for managing nuclear weapons and nuclear dangers had been achieved. No sober assessment today would arrive at that conclusion. Rather, there is a wide belief that the global nuclear order is deteriorating, that the mechanisms and instruments employed in the past to manage the nuclear problem – negotiations, agreements, norms and institutions – are being undermined, ignored, abandoned, or rendered ineffective. At the same time, there has been no retreat from nuclear weapons in the policies of nuclear powers and the appetite for nuclear weapons still exists among some other states.

What are the grounds for fear about the nuclear future? Five broad sets of concerns cloud the horizon.

First, far from retreating from and marginalizing nuclear weapons, the largest nuclear powers have in fact re-committed themselves to nuclear weapons.[5] Their nuclear addiction appears as potent as ever. Though many from both ends of the political spectrum believe that nuclear weapons should be devalued in the aftermath of the Cold War[6], in fact both Russia and the United States have reaffirmed the centrality of nuclear weapons in their security policies. Both envision the retention of nuclear weapons for the long run – indeed, for the indefinite future. They have been outspoken in asserting that nuclear weapons are not merely useful, but essential, in their security postures. Both adhere to doctrines that retain the articulated option of first use of nuclear weapons. When in the mid-1990s, the International Court of Justice was considering the international legal status of nuclear weapons, the nuclear weapons states (led in particular by the United States) were adamant in insisting that nuclear weapons are legal and legitimate instruments of national policy. All this despite the end of the political rivalry that justified their nuclear postures in the first place.

The re-embrace of nuclear weapons by the United States and Russia sends a powerful message about the alleged beneficial effects of nuclear acquisition and makes it harder to press a compelling case against the acquisition of nuclear weapons by other states.

Thus, the case for nuclear weapons continues to be made – in both word and deed – by the largest nuclear powers. If nuclear weapons are legal, legitimate and moral, if they confer enormous security benefits, if they are essential to the defense arrangements of even the largest and most powerful states, then why should all others forsake them forever? If nuclear weapons remain a central currency of world power, if they continue to be regarded as the ticket to the high table of international politics, why won't other states be tempted to seek this power and this status for themselves? The re-embrace of nuclear weapons by the United States and Russia sends a powerful message about the alleged beneficial effects of nuclear acquisition and makes it harder to press a compelling case against the acquisition of nuclear weapons by other states.[7] Nuclear weapons have not receded to the margins of international politics – but so long as they remain at the center of great power relations and global power politics, nuclear risks and nuclear temptations will persist.

Second, the bilateral arms control process between Russia and the United States appears to be at an end. Over several Cold War decades, Moscow and Washington built up a framework (consisting of negotiations, arms control agreements, and associated institutions) that restrained and regulated their nuclear relationship and provided a framework within which reductions would occur. Today, there are no active strategic arms control negotiations between

Russia and the United States and none are in view. Indeed, a prominent school of thought in the United States vigorously offers the view that such arms control is a relic of the past and sees little or no role for it in US policy.

Even as bilateral arms control has disappeared from the current policy agenda in US-Russian relations, significant portions of the arms control edifice that once existed have been removed from the picture. The ABM Treaty, long regarded as the cornerstone of the strategic arms control regime, ceased to exist when the United States exercised its right of unilateral withdrawal in 2002. Arguably, the question of missile defense needed to be rethought in the post-Cold War era and there is no reason to assume that the arguments and conclusions of the past retain their relevance in what is by now a very different world. By the same token, there is no reason to assume the wisdom of jettisoning the treaty at a time when the United States is very far from being in a position to deploy meaningful missile defenses – not least because this step occurred despite the evident displeasure of the Russian government (President Putin described it as a mistake) and despite the expressed consensus preference of the 2000 NPT Review Conference that the ABM Treaty be perpetuated. The Bush Administration was very willful on this issue, but the world by and large disagreed with its policy. The United States has paid a substantial political price in order to gain the freedom to prematurely deploy missile defenses that are at present almost completely ineffective.

Furthermore, one consequence of the withdrawal from the ABM Treaty was the demise of the START II agreement signed by Presidents Bush and Yeltsin in1993. The Russian Duma had made ratification of START II explicitly conditional on the perpetuation of the ABM Treaty, which meant that the Bush Administration's determination to pursue missile defense in an unrestricted fashion guaranteed that START II would never enter force.[8] (Among other things, START II would have eliminated multiple warhead missiles and compelled a timetable of reductions.) Thus, two of the major components of the arms control framework that resulted from years of painstaking negotiations between Washington and Moscow have been abandoned. Remarkably, the foundational document governing the US-Russian nuclear relationship is the START I agreement, which has its origins in the first term of the Reagan Administration.

The end of strategic arms control was punctuated by the signing on May 24, 2002, of the Strategic Offensive Reductions Treaty. At a summit in Moscow, Presidents Bush and Putin put their names to this brief, peculiar, and perfunctory agreement (commonly known as the Moscow Treaty). In this agreement, the parties agree to reduce strategic nuclear warheads to 1700-2200 by 2012. However, the treaty expires on the same day – December 31, 2012 – that its limit takes effect. The treaty provides no careful definition of that which is being

limited. There is no provision for the elimination of warheads removed from deployed forces. Spares, reserves, and tactical nuclear weapons are uncovered by the treaty. There is no constraint on modernization, nor does the Moscow Treaty impose any limits on delivery systems. There is no timetable for implementation. The treaty contains no specific verification provisions and does nothing to increase the transparency of the US-Russian nuclear relationship. In its scope and coverage, the Moscow Treaty is significantly less ambitious and less consequential than the provisional agreed framework that emerged in 1997 at the Helsinki Summit between Bill Clinton and Boris Yeltsin; the Moscow Treaty was not a bold step forward but a considerable step backwards compared to what was under consideration five years earlier.[9] As one critic concluded, "This meager agreement – which fits on less than one typeset page – hardly deserves to be called a treaty."[10]

In short, arms control is waning in the bilateral relationship that encompasses most of the world's nuclear weapons. This reality would matter little if the nuclear agenda in the US-Russian relationship were finished, if there were no significant issues still to be addressed, if the process of shrinking and marginalizing their nuclear arsenals was largely complete, if the world found this circumstance to be satisfactory. But such is not the case.

Third, in recent years the nonproliferation regime has been subjected to an unusual series of stresses and challenges. A high-water mark was achieved in 1995 with the indefinite extension of the Nuclear Nonproliferation Treaty (NPT) but the subsequent decade has witnessed a sequence of serious blows and setbacks for the regime. In 1998, India and Pakistan tested nuclear weapons and explicitly proclaimed their status as nuclear weapon states. This did not represent an affront to the legal NPT regime because neither Islamabad nor Delhi had signed the NPT; they simply exercised their legal right to acquire nuclear weapons. However, this was the first open expansion in the number of nuclear weapon states in several decades. It shattered the hope that there existed a powerful and effective norm of nonproliferation. Obviously, whatever norm may be said to exist was not sufficient to prevent the acquisition of nuclear weapons by India and Pakistan. Furthermore, though there was criticism of the Indian and Pakistani tests and some countries responded by imposing some limited sanctions, neither has suffered lasting damage to its international position as a consequence of nuclear acquisition. On the contrary, both have subsequently (in the aftermath of 9/11) developed special relationships with the United States. The world has rather rapidly accommodated the emergence of two new nuclear-armed states.

The NPT regime has also been plagued by difficult and corrosive compliance controversies. One has involved a still unresolved dispute over Iran's nuclear

activities. By its own admission, Tehran has engaged in noncompliant behavior – notably in failing to report legitimate nuclear activities, as required by safeguards agreements. Iran insists that when its transgressions came to light, it worked with the International Atomic Energy Agency to redress the situation and to restore Iran's good standing in the IAEA system. Others however, led most vociferously by the United States, believe that Iran's comprehensive development of nuclear infrastructure and its failure to report such activities are signs that Iran is seeking nuclear weapons. Though Tehran denies any such aspiration, those convinced that Iran is pursuing nuclear weapons believe that the NPT regime is failing to adequately address a case in which a state is not fulfilling its legal obligations under the NPT. Those who share this conclusion doubt the value of the NPT in coping with the most important proliferation problems.

Another compliance controversy involves the nuclear weapons program of North Korea and represents a clear failure for the NPT system. Pyongyang's nuclear activities have been a source of concern since the early 1990s. Indeed, the IAEA formally declared North Korea to be in a state of noncompliance in 1993 and its nuclear program was subject of intense diplomatic focus throughout the 1990s. But the saga entered a dramatic new phase late in 2002. Apparently prompted by a growing confrontation with the United States, the North Koreans moved vigorously to escape the scrutiny and constraints of the IAEA system. Pyongyang expelled IAEA inspectors, shut down IAEA cameras, and untagged, unsealed and relocated its spent fuel rods that had been tagged, sealed, and counted by the IAEA. It acted to resume its nuclear activities, reopening its plutonium reprocessing facility and restarting its long-dormant nuclear reactors. Early in 2003 North Korea announced its withdrawal from the NPT and by April 2003 it declared that it had acquired nuclear weapons. This development has provoked dismay and criticism, but to date the international response has been ineffectual and the NPT regime has proven incapable of coping with the sort of challenge posed by Pyongyang. To the NPT's growing number of critics, this case is proof conclusive that the regime is not adequate to protect against the spread of nuclear weapons to determined proliferators.

Reinforcing the perception that the NPT regime may be experiencing a significant erosion was the startling revelation in 2003 of the AQ Khan network.[11] Over a period of many years, Pakistan's leading nuclear scientist and father of Pakistan's nuclear weapons was running a private nuclear bazaar, selling weapons-related technologies and expertise to aspiring proliferators. This network was profoundly subversive of the NPT regime, intentionally circumventing and undermining the technological barriers to proliferation erected by the nonproliferation regime. Several states are known to have done business with

the AQ Khan network and there are fears and suspicions that others may also have advanced their nuclear ambitions in this way. It appears that, among other things, nuclear weapon designs were provided by the AQ Khan network to at least some of its clients. Very few developments in the history of the nuclear age have been as damaging to the nonproliferation regime as the activities of the AQ Khan network.

Even as the NPT regime is struggling to cope with one blow after the next, there is a visible and growing disaffection and distemper on the part of many of its adherents. Numerous non-weapons states are increasingly impatient with and frustrated by the failure of the nuclear weapons to make tangible progress toward fulfilling their nuclear disarmament obligations under Article VI of the NPT. Some non-weapons states resent and are angered by efforts of nuclear suppliers (led by the United States) to restrict the spread of dual use nuclear technologies that have both civil and military applications; such restrictions, they insist, are in violation of Article IV of the NPT, which confers on signatories the right to acquire nuclear technology for peaceful purposes provided it is appropriately safeguarded. Nevertheless, some in the nuclear supplier community are reluctant to facilitate the spread of technologies that can constitute the infrastructure of a nuclear weapons program, no matter what safeguards are put in place. Considerable ill will has arisen in some quarters over this issue. But the discontent of the non-weapon states is fully matched by the disillusionment with the NPT regime found in influential groups within the United States. Current US policy is shaped by a profound skepticism about the effectiveness of the NPT. The antagonisms contained within the NPT system were clearly manifest in the 2005 NPT Review Conference, which ended in failure.

In short, across several decades the NPT system has made a significant contribution to restraining the spread of nuclear weapons. It remains an important – many would argue, a crucial – instrument in the global management of the nuclear threat. But today the health of the regime is poor, its value questioned, is effectiveness doubted, its durability uncertain, it attractiveness challenged by weapon states and non-weapon states alike.[12] The NPT regime is, many believe, in a state of serious crisis.[13]

Fourth, there has emerged a growing fear of nuclear terrorism. Concern about this threat arose initially in the aftermath of the collapse of the Soviet Union as a result of the possibility that insecure holdings of nuclear weapons and nuclear materials in the former Soviet Union might find their way into the hands of terrorists.[14] This issue pressed itself even more urgently on the agenda after the terrorist attacks in the United States on September 11, 2001. Suddenly it was unambiguously clear that there existed terrorist groups willing and

even eager to mount terrible attacks and wishing to cause mass casualties. Indeed, when Al Qaeda came under close scrutiny after 9/11, it became evident that this terrorist group had interest in nuclear, biological, and chemical weapons as well as an explicitly declared desire to kill millions of Americans. In combination, the existence of insecure holdings of nuclear assets and terrorists aiming to cause mass casualties produced a realization that here was a new problem that represented an enormous menace. Indeed, in the US presidential election of 2004 both candidates agreed that the risk of nuclear terrorism was the most significant threat to American security.

The threat of nuclear terrorism can be minimized only by ensuring that all inventories of nuclear weapons and the materials to make them are held in adequate conditions of safety and security. This requires a comprehensive global program to establish stringent standards for the safety and security of nuclear assets and to ensure that all countries with nuclear programs meet these standards (including not only Russia's vast nuclear holdings, which have received considerable attention, but those of all other countries engaged in nuclear activities that involve weapons-usable material). Unfortunately, while some progress has been made in this direction, it has been distressingly slow, halting, and incomplete, so that the risk of theft or illicit sale of weapons or materials remains. This means that it is still possible to imagine circumstances in which terrorists obtain nuclear weapons or the wherewithal to make them. Should this happen, a nuclear terrorist attack on one or more cities becomes a distinct possibility. Indeed, one leading expert argues that nuclear terrorism is inevitable unless comprehensive remedial action is taken on a time scale much more rapid than any in evidence so far.[15] Here, then, is another route to the use of nuclear weapons, one that seems far more plausible and worrisome today than in the past.

Fifth, cutting across many of these points is a new, more assertive set of policies by the United States.[16] An influential school of thought, generally dominant in the Bush Administration and ascendant in the US Congress, views arms control skeptically, questions the utility and adequacy of multilateral arms control, and prefers to rely on US power rather than international regimes for addressing emerging nonproliferation problems.[17] Over recent years, the United States has rejected some arms control measures – such as the comprehensive test ban treaty, the verification protocol of the biological weapons convention, the Land Mine Treaty, as well as the international criminal court. It has withdrawn from the ABM Treaty. It explicitly repudiated the thirteen arms control steps called for in the consensus document negotiated at the 2000 NPT Review conference and refused to countenance discussion of the thirteen steps at the 2005 Review conference. Simultaneously, the United States is exploring

new nuclear weapons designs, investing in its infrastructure for nuclear testing, and has promulgated a long-term program of nuclear modernization – all in the name of reinforcing nuclear deterrence.

In the decades since the end of World War II, the United States has generally played an important global leadership role in promoting arms control, international law, and international institutions. Now Washington seems to have turned its back on that legacy, preferring freedom of action and self reliance to treaties and regimes, preferring to dismiss or dismantle rather than build and promote the framework of agreements and management mechanisms that have shaped the global nuclear order and – many believe – helped to tame its dangers. The Bush Administration judges that this diplomatic legacy is either unsuccessful or irrelevant or inadequate to cope with present challenges. It offers instead an approach, rooted in American power, that it believes is both necessary given the threats that now exist in this post-9/11 world and superior to what it regards as the insufficiently effective approaches of the past. Rather, to address nuclear threats, the United States will deploy defenses to thwart attackers, it will (under the Proliferation Security Initiative) interdict illicit shipments whenever and wherever they are suspected, it will seek to identify and punish those who do business with aspiring proliferators,[18] and it will seek to isolate, ostracize, and penalize those hostile states seeking weapons of mass destruction. In its most controversial policy, the Bush Administration has proclaimed the right and the intention to use force against proliferators it deems sufficiently threatening. Eliminating such regimes, it is argued, is truly the most effective nonproliferation policy – indeed, some would argue this is the only truly effective nonproliferation policy.[19] This doctrine of preventive force led, of course, directly to the war in Iraq. Many around the world criticized and opposed the war as unnecessary and illegal, but to the Bush Administration and those who supported it the intervention represented a rare instance in which the nonproliferation regime was actually effectively enforced and UN resolutions were actually given teeth. As one supporter put it, the Iraq war is "the most important arms control action in 50 years."[20] Or is it, as UN Secretary General Kofi Annan has suggested, a lawless act likely to provoke proliferation by those most fearful of Washington's wrath?

While the Bush Administration's more controversial policies will inevitably provoke division and disagreement, there is much in Washington's current array of nonproliferation policies that is sensible and indeed completely compatible with existing and potential arms control frameworks. Finding ways of more effectively preventing the spread of nuclear weapons and enforcing arms control agreements should command wide support – perhaps especially among those

who believe that arms control represents a valuable tool of statecraft. Instead, Washington's new directions inspire deep unease. Even the Bush Administration's constructive steps are viewed in the context of its openly articulated disdain for arms control, its disregard for international law, its refusal to accept constraints on its own behavior, and its professed willingness to act unilaterally and to use force whenever it feels a need to do so. Viewed in this wider context, Bush's policies – even their most uncontroversial and worthwhile elements – seem part of an effort to downgrade or supplant arms control and international cooperation rather than a genuinely serious attempt to make existing regimes better and more effective.

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Hence, as it seems to much of the world, we head off into the next sixty years of the nuclear age with the most powerful and influential state displaying wholly different and unfamiliar impulses, reversing patterns of behavior half a century in the making, charging into an uncharted future. The Bush Administration is confident that its approach will bring peace and security in its wake. Many others fear that the frameworks and mechanisms built up over half a century are now being jeopardized, that the instruments that contributed to safe passage though decades of nuclear danger are being undermined or cast aside, that the imperfect but adequate approaches of the past are being superceded by a very different approach that rests ultimately on unproven claims about the efficacy of American power. Perhaps the Bush Administration will be proven correct; this is a hypothesis that is now being tested. But those who do not share the Bush Administration's confidence that this will be the case are dismayed at the uncertainties and dangers that may lie ahead, at the unfamiliar and potentially distressing nuclear age we are in the midst of creating. As Graham Allison has written, "Sixty years after Hiroshima…, the regime is falling apart and the threat lingers on."[21]

When the Cold War ended fifteen years ago, there were high hopes that a new and better world would now be possible – a world in which the dangerous nuclear rivalry receded into history and nuclear weapons were relegated to the margins of world politics. With the revolutionary transformation after 1991 in relations between Washington and Moscow – from bitter rivals to friendly occasional collaborators – it seemed as if there would be much greater scope for progress in arms control, much less need for nuclear weapons, and much greater prospect for building international institutions and a more cooperative international order.[22] With the passage of fifteen years, we can see that these hopes have been almost completely disappointed.[23] Nuclear weapons have not been marginalized but remain prominently enshrined in the security poli-

cies of nuclear-armed states. The bilateral arms control process that has governed the overwhelming majority of the thousands of nuclear weapons on this planet has waned, with past agreements undone and future agreements unsought. Multilateral arms control appears to be in a condition of indefinite dead stop, with little prospect for meaningful progress in any context. The nonproliferation regime is under unprecedented assault, beset by so far intractable problems, with many states asserting its inadequacy and few displaying the political will and substantive wisdom to salvage and strengthen it. The rise of the nuclear terrorism threat has added a new peril to the scene and has raised the challenge of dealing with substate actors who are not constrained by existing institutions. And these unsettling realities are compounded by the fact that the United States, formerly the great patron of arms control and international institutions, has dramatically changed course and now appears indifferent to or hostile toward many of the international arrangements it was centrally involved in creating. Humankind has survived sixty years without nuclear disaster, but this is no guarantee that the nuclear future will be managed wisely or effectively. The present turbulent state of the global nuclear order, the potential breakdown of existing restraint regimes, the possible spread of nuclear weapons to many other states, and the continuing centrality of nuclear weapons in the war plans of multiple states all highlight the extreme pertinence of the grave warning issued by the Russell-Einstein manifesto. The possible breakdown of that order brings us face to face with risks of the highest order. Anyone who doubts this should visit the Hiroshima Atomic Museum.

Conclusion

Bertrand Russell understood immediately the portentous implications of the nuclear weapon. When, in August 1945, he learned of the atomic bombing of Hiroshima, he sat down and wrote yet another remarkable essay, under the title "The Bomb and Civilization."[24] He offered a powerful response to the awful reality of what had happened in Hiroshima. "It is impossible," he wrote in his opening sentence, "to imagine a more dramatic and horrifying combination of scientific triumph with political and moral failure than has been shown to the world in the destruction of Hiroshima." But his deeper concern was with the broader and enduring implications of what had just happened on a beautiful clear morning in Japan. Russell was filled with foreboding:

"The prospect for the human race is somber beyond all precedent. Mankind is faced with a clear-cut alternative: either we shall all perish, or we shall have to acquire some slight degree of common sense. A great deal of new political thinking will be necessary if utter disaster is to be averted."

Even in the first hours of the nuclear age, Russell arrived at the conclusion that represented his own judgment about what sort of new political thinking was necessary to survive the nuclear age, the conclusion to which he clung to the very end of a very long life. In an exact foreshadowing of the Russell-Einstein manifesto, he wrote, "Either war or civilization must end…."

What Russell instantly grasped, and never lost, was a comprehension of the fact that vast and irreducible dangers inhere in the mere existence of nuclear weapons. This same realization lies at the heart of the Russell-Einstein manifesto. Though the world has grown accustomed to life in the nuclear age and complacent about its risks, these dangers never go away. Indeed, as defense intellectual Fred Ikle reiterates in an article written almost exactly sixty years after Russell's 1945 essay, nuclear weapons raise "profoundly serious problems that dominate the nuclear age, casting a dark shadow far into the future." The fundamental problem, Ikle warns, is that nuclear weapons might someday again be used, with incalculable consequences:

"We have become habituated to – indeed utterly dependent on – a world order predicated on the non-use of nuclear weapons. This order might end abruptly. It would be a unique revolution in military affairs if the most powerful weapons in the arsenals of many nations were never used….The paroxysm after 9/11 would be a hiccup compared to the reaction the morning after one or more nuclear bombs caused massive devastation."

But there is no easy escape from this risk. As Ikle laments, "We know how we entered the nuclear age. We do not know how to exit from it."[25] Thus do Russell's instant insights reverberate across the decades, losing none of their force or relevance.

The Russell-Einstein Manifesto was a historic and memorable clarion call, not as a guide to action but as a vivid and powerful statement of the dangers that exist and the outcomes that must be avoided in the nuclear age. The nuclear order that emerged after 1955 was far from that envisioned by the crafters of the manifesto. Nevertheless, it sufficed to avoid the nightmare feared by the signers of the Manifesto and contained many innovative and constructive elements. We have survived six decades of the nuclear age by creating a global nuclear order that contained instruments of restraint, regulatory mechanisms, implementing institutions, and frameworks for dialogue across hostile divides. Now important elements of that order are being questioned, doubted, criticized, defied, or abandoned. The inescapable perils of the nuclear age persist, some new dangers have arisen, but the evolved system for limiting nuclear risks and avoiding nuclear dangers seems weakened and eroding. Thus, though some comfort can be drawn from the record of six decades since the use of two atomic

bombs in 1945, there is no reason to be complacent about the future. Managing the coming nuclear age is sure to be at least as taxing of human reason and ingenuity as were past decades –and the dangers will be possibly even greater.

Viewed in the light of five decades of subsequent experience, the Russell-Einstein Manifesto appears to have been off-target, combining an overstated sense of the immediate dangers with an unreachable visionary prescription. And yet its message endures and resonates with present concerns, perhaps because at some elemental level it captures an essential truth: nuclear weapons do pose an unprecedented challenge to mankind and require eternal vigilance if disaster beyond imagining is to be averted. The real focus should be not on the subsequent fifty years safely (if dangerously) traversed, but on the eternity to come in which the nuclear affairs of the planet must be managed without misstep by imperfect and occasionally irrational human beings in a world plagued by conflict and violence. As Bertrand Russell wrote which characteristic vividness in his memorable last essay, nuclear peace must hold "throughout future ages, until the sun grows cold."

Notes

[1] An excellent detailed account of the origins and initial impact of the Russell-Einstein Manifesto is Sandra Ionno Butcher, "The Origins of the Russell-Einstein Manifesto," Pugwash History Series, No. 1, May 2005.

[2] Bertrand Russell, "Last Essay: 1967," found at www.humanities.mcmaster.ca/%7ET Russell/bressay.htm.

[3] On this point, see Nina Tannenwald, "Stigmatizing the Bomb: Origins of the Nuclear Taboo," *International Security*, Vol. 29, No. 4 (Spring 2005). Tannenwald draws attention to an essay by Thomas Schelling ("A Half Century Without Nuclear War") in which he suggests that the evolution of the taboo against nuclear use "has been as important as the development of nuclear arsenals." Quoted in Tannenwald, p. 6.

[4] Relevant here is the conclusion offered by Michael Levi: "In sixty years, we haven't found any solutions, but we've done remarkably well at muddling through. That's probably not a bad strategy for the next sixty years, too." From Michael Levi, "Past Imperfect: The Nuclear Age Turns Sixty," *The New Republic Online*, July 16, 2005, as available at www.tnr.com.

[5] I have discussed this at greater length in Steven E. Miller, "Is the NPT System Slowly Dying? Seven Challenges to the Regime," in Center for Policy Analysis and Planning, *Conference on Nuclear Proliferation*, (Athens, Greece: Ministry of Foreign Affairs, 2004), pp. 45-63.

[6] An articulate concise expression of the arms control perspective on devaluing nuclear weapons is John Holdren, "Is There a Role for Nuclear Weapons Today?," *Arms Control Today*, Vol. 35, No. 6 (July/August 2005), p. 8. But for similar conclusion offered from a very different point in the political spectrum, see also the comments of Richard Haass, formerly Director of Policy Planning in the current Bush Administration and now President of the Council on Foreign Relations. As described by Brian Urquhart in

a review of Haass's new book, *The Opportunity: America's Moment to Alter History's Course* (Public Affairs, 2005), Haass believes that "the objective of the United States should be to delegitimize and reduce, as far as possible, 'the currency and symbolic value' of nuclear weapons." From Brian Urquhart, "The New American Century?" *New York Review of Books*, August 11, 2005, p. 39.

[7] But for the contrary view, disputing the connection between US nuclear behavior and the incentives of potential proliferators, see Keith B. Payne, "The Nuclear Posture Review: Setting the Record Straight," *The Washington Quarterly*, Summer 2005, pp. 145-146.

[8] On June 14, 2002, immediately after the US withdrawal from the ABM Treaty, Russia stated that it would no longer honor its START II commitments. See "START II and It Extension Protocol at a Glance," Arms Control Association Fact Sheet, January 2003.

[9] For overviews of the Moscow Treaty and its deficiencies, see the Natural Resources Defense Council, "The Moscow Treaty's Hidden Flaws," February 3, 2003, as available at www.nrdc.org/nuclear/moscow/moscflaw.asp; and Union of Concerned Scientists, "The Moscow Treaty," Global Security Backgrounder, March 6, 2003, as available at www.ucsusa.org/global_security/nuclear_weapons.

[10] "The Moscow Treaty's Hidden Flaws," p. 1.

[11] For a thoughtful overview of the Khan network and its implications, see David Albright and Corey Hinderstein, "Unraveling the A.Q. Khan and Future Proliferation Networks," *The Washington Quarterly*, Spring 2005, pp. 111-128.

[12] According to one particularly illuminating account of the Bush Administration's approach to arms control, the NPT is said to be viewed by key officials as "pointless. Only those who find it in their interest to obey will do so, Bush officials say, and the rest will cheat." Bill Keller, "The Thinkable," *New York Times Magazine*, May 4, 2003, p. 52.

[13] See, for example, Burkard Schmitt, "NPT Breakdown," EU Institute for Security Studies Newsletter, No. 15 (July 2005), p. 3, which that the accumulating setbacks to the regime, including the failure of the 2005 Review Conference, have "plunged the NPT into a deep crisis of both compliance and confidence."

[14] An early overview of this problem is Graham Allison, Owen Cote, Richard Falkenrath, and Steven Miller, *Avoiding Nuclear Anarchy: Containing the Threat of Loose Russian Nuclear Weapons and Fissile Material* (Cambridge: MIT Press, 1996).

[15] Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe*, (New York: Henry Holt, 2004).

[16] For a concise and illuminating exposition of the foreign policy instincts now evident in Washington ("the revolutionary ideology of American revivalism"), see Walter Russell Mead, *Power, Terror, Peace and War: America's Grand Strategy in a World at Risk*, (New York: Alfred A. Knopf, 2004, especially pp. 109-137.

[17] Far a detailed elaboration of this point, see Steven E. Miller, "Skepticism Triumphant: The Bush Administration and the Waning of Arms Control," in Hans J. Giessmann, Roman Kuzniar, and Zdzislaw Lachowski, eds., *International Security in a Time of Change: Threats, Concepts, Institutions*, (Baden-Baden: Nomos Verlagsgesellshcaft, 2004), pp. 15-40. Symptomatic of this perspective and its influence in Washington is the Bush Administration's plan to reorganize the State Department so as to cut most arms control offices and eliminate a number of senior arms control positions. See David Ruppe, "Bush Looks to Cut State Department Arms Control Offices," Global Security Newswire, August 3, 2005.

[18] For the latest initiative aimed at punishing and deterring private sector actors who facilitate proliferation by hostile states, see Dafna Linzer, "US Plans New Tool to Halt Spread of Weapons," Washington Post, June 27, 2005,

[19] For thoughtful alternative perspectives on what the nuclear agenda should be, see George Perkovich, Joseph Cirincione, Rose Gottemoeller, Jon Wolfsthal, and Jessica Matthews, *Universal Compliance: A Strategy for Nuclear Security*, (Washington DC: Carnegie Endowment for International Peace, 2004); Aston B. Carter, "How to Counter WMD," *Foreign Affairs*, September/October 2004, pp. 72-85.

[20] Professor Paul Bracken of Yale University, as quoted in Keller, "The Unthinkable," p. 102,

[21] Graham Allison, "Sixty Years Later: Hiroshima and the Bomb," Center for American Progress, as available at www.americanprogress.org.

[22] See, for example, the set of recommendations prominently offered by the US National Academy of Science's Committee on International Security and Arms Control in *The Future of US Nuclear Weapons Policy* (Washington DC: National Academy of Sciences, 1997) which urges, among other things, very deep cuts in overall nuclear arsenals, adoption of no-first-use doctrines, the establishment of high levels of transparency, the steady enlargement of restraint regimes, and advocates the objective of achieving the prohibition of nuclear weapons. For a more recent dissent from the direction of current policy, see Sidney Drell and James Goodby, *What Are Nuclear Weapons For? Recommendations for Restructuring US Strategic Nuclear Forces*, (Washington DC: An Arms Control Association Report, April 2005).

[23] It is worth noting that this conclusion would have been only somewhat different in 2000. A decade into the post-Cold War era, before the advent of the Bush Administration, leading experts were writing of "disappointed expectations" and a "crisis of confidence shaking the arms control regime. See, for example, Joseph Cirincione, "Historical Overview and Introduction," in Joseph Cirincione, ed, *Repairing the Regime: Preventing the Spread of Weapons of Mass Destruction* (New York: Routledge, 2000), pp. 1-3, from which this language is drawn.

[24] Bertrand Russell, "The Bomb and Civilization," August 1945, available at www.humanities.mcmaster.ca/%7Erussell/brbomb.htm.

[25] The quotes in this paragraph are from Fred C. Ikle, "Nuclear Explosion," *Wall Street Journal*, August 5, 2005.