Weapons of Mass Destruction: Major Wars, Regional Conflicts, and Terrorism

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The twentieth century saw the creation and development of weapons of mass destruction (WMD): nuclear, chemical, and biological. In the following article, Ryukichi Imai, distinguished research fellow at the Institute for International Policy Studies and visiting professor at Kyorin University, Japan, describes the history of WMD and the international treaties that have been negotiated on their non-proliferation. He focuses on the history of the nuclear bomb from its first tests, to the nuclear arms race and the subsequent deterrence. He goes on to examine the issues surrounding the nuclear hot-spots of South Asia and North Korea, as well as the feasibility and effects of chemical and biological weapons. He argues that the suicide plane attacks on 11 September changed the very concept of WMD and that any future threat of a mass destruction is likely to come from terrorists beyond the reach of governments.

Until 11 September 2001, most people did not ponder about the exact point at which conventional weapons became ones of “mass destruction.” It was clear that nuclear explosives were weapons of mass destruction (WMD) and, for the scale of the potential damage, so were chemical and biological weapons, although the method of destruction is completely different. Even with a single nuclear explosive device, people can be killed from the shock waves, radiation, heat or flying debris. Until recently, the definition of WMD as the use of an unconventional means of attack leading to an unprecedented number of victims had sufficed.

This changed with the terrorist attacks on the New York Trade Center buildings and the Pentagon. The number of victims exceeded 5000 and it is impossible to detect the manner in which each victim died. The equivalent of more than 400,000 pounds of TNT, or 0.2 kilotons (Kt) of energy in nuclear explosion, were used on the attack of the two trade center towers. This number roughly corresponds to the “fizzle yield” of the first test of the atomic bomb, Trinity, in Alamogordo.

Bombs laden with vast quantities of jet fuel, crashing into skyscrapers at high speed used to be the stuff of popular paperbacks: it has now been enacted in reality.
That the US president’s immediate reaction would be to retaliate against terrorism and by implication, WMD, was only to be expected. Thus, putting aside the issue of the applicability of the term, “war,” it was inevitable that President Bush should choose to declare a “war on terrorism” and mount a military offensive against the perpetrators. After all, a meticulously organized, large-scale terrorist act against non-combatant citizens is a war.

Concept of WMD in early postwar period

Based on the scale of damage, one could argue that the raids against Dresden and the Tokyo fire raid during World War II was an attack of “mass destruction,” as these fire attacks led to a greater number of civilian victims and damage to infrastructure than either of the bombs dropped on Hiroshima or Nagasaki. The precise number of victims are not known nor could the raids be defined as WMD, as they do not fit the technical definition. In any case, a numerical distinction between “mass” and “ordinary” destruction is extremely difficult (except perhaps in a theoretical discussion).

In the first instance, WMD clearly refer to nuclear warheads. Whilst the air attacks during World War II were destructive, the scale of strategic bombing increased to an unmatched level with the bombing of Hiroshima and Nagasaki. The bomb “Little Boy” detonated over Hiroshima had the explosive power equivalent to 13 Kt of TNT, which is a level of destructive capability that simply cannot be produced using conventional weapons. If the initial 1945 Los Alamos calculations had been correct, the bomb would have yielded a minimum explosion of about 1 Kt of TNT equivalent. In the end, the yield was 19 Kt but even the minimum explosive power was unprecedented. Later, the explosive power of the thermonuclear, or hydrogen, bombs was to be even more impressive. In terms of the energy produced—one megaton (Mt)—it would not be possible to create the same level of destruction by conventional weapons as it was physically impossible to amass, aim and detonate the equivalent, one million tons of gunpowder TNT (which would have required several large cargo ships), on a specific target, simultaneously. In the early days, the size of thermonuclear bombs had been huge to allow for inaccuracies in aim. In addition to the massive destruction, such a large scale is no longer necessary as, due to improvements in circular error probable (CEP), the ability to hit the target has improved. Thus, large thermonuclear warheads are WMD, exceeding a practical purpose, except perhaps to attack a super or super hardened missile silo.

It is not clear if the term WMD had been employed before 1945, but the concept it represented clearly started from the atomic bombs dropped on the two Japanese cities. The difficulty of the concept can be assessed by the internal debate that took place within the US administration as to whether to drop the bombs on targeted cities or to give a demonstration as a warning. The scale and impact of explosion was difficult to envisage without an understanding of the theory and to construct a
realistic demonstration was too time consuming during war time. Underestimating the efficacy of the atomic bomb and fearing that a demonstration, such as an explosion at sea, would not be sufficiently powerful enough to bring the Japanese government to surrender, thereby prolonging the war, the final decision was to not give a demonstration. The cities on the list of targets was discussed and the bombing of Hiroshima and Nagasaki took place. Even today, when people have experienced simulated demonstrations of nuclear attacks, the destructive power demonstrated at Hiroshima and Nagasaki remains unparalleled.

During the late 1940s, whilst the US had continued to research and produce atomic bombs, the rest of the world had not been fully aware of the scale of mass destruction involved. The Union of Soviet Socialist Republics (USSR), had also been researching atomic bombs and in 1949 exceeded American expectations in successfully developing their own atomic bomb, due mainly to the work of Yuri Khariton at Arzamas 16 assisted by the information provided by the spy, Klaus Fuchs, a scientist who had been at Los Alamos. In the early years, atomic bombs in both the US and USSR were regarded as very large, exceptional bombs, but bombs nevertheless. The experts did not take into sufficient account the harmful affects such as radiation, the blasts, fast traveling heat waves, which was why there was a lack of concern about the disposal of radioactive liquid and waste material produced from weapons grade plutonium in both the US (at Hanford) and the Soviet Union (at Krasnoyarsk and Chelyabinsk). It is possible to visit Hanford, which is now a vast deserted desert, to see the scale of weapons plutonium that had been produced in the past. One would quickly realize that scant attention was paid to safety from radiation. In both countries there are records of the battle exercises and simulations which took place with foot soldiers charging into areas where small nuclear weapons had just been exploded. In these early years, a clear distinction between nuclear and conventional weapons had not been made. Thus, ignorance of the long-term effect of exposure to radiation was not limited to the general public but was also pervasive amongst the so-called experts.

The Bikini atoll

The 1954 US hydrogen bomb tests in the Bikini atoll demonstrated that with nuclear weapons the world was entering a fundamentally different era of destruction. At the tests, the explosion produced over 10 Mt of energy, or 10 million tons of TNT equivalent. Much of Bikini atoll was scattered and highly radioactive fallout spread beyond the controlled area due to unexpected wind change. As a result, the Japanese fishing boat, Dai Go Fukuryû Maru, (the No. 5 Lucky Dragon), was exposed to radiation, killing crew members and contaminating their catch. Antinuclear movements around the world began after this test: It was after the Bikini test that the Russell–Einstein Declaration was made calling for the ban of WMD, named after the two principal supporters, Bertrand Russell and Albert Einstein. Within a matter of weeks, radioactive contamination left a lasting environmental impact.
Such advances in science and technology eventually led to the state of “mutual assured destruction” (MAD). Despite the growing concern expressed by antinuclear movements and local populations, nuclear tests have continued to be carried out in the South Pacific, in Semipalachinsk in Kazakhstan, and Novaya Zemlya in Russia.

Concern on how best to control nuclear energy did not suddenly mushroom after the contamination of the Bikini atoll tests. In January 1946, the United Nations agreed to set up the UN Atomic Energy Commission (UNAEC). Disquiet about the destructive capabilities of nuclear energy in the US led to the proposal of the Baruch Plan, which suggested the setting up of an international mechanism to control the atom. Opposition from the USSR meant that it could not be adopted and it was not until 1957, that the International Atomic Energy Agency (IAEA) would be created. Opposition from the USSR stemmed from a suspicion of American motives whilst the US held the monopoly on atomic bombs. Thus, eager to gain atomic capabilities, research on nuclear physics became a soviet priority and in 1949, the USSR carried out its first atomic test. In 1953, President Eisenhower presented the “Atoms for Peace” proposal to the UN General Assembly to distinguish between the military and peaceful purposes of the atom. In retrospect, the efforts to use the atom for peaceful means—for energy—were successful, in light of the events of the era after the 1973 Fourth Middle East War.

**Cuba, PTBT, NPT**

In 1962, the Cuban missile crisis convinced the world that the threat of a nuclear war was real but should be avoided at all cost. The world would have been very different if the US marines had landed on the Cuban beach on that Monday morning of 30 October 1962: the Soviet response would have been to use the tactical nuclear weapons they were constructing in Cuba, aimed at Washington D.C. and the stockpile of intercontinental ballistic missiles (ICBM) in the Midwest. A US retaliation of long range nuclear missiles aimed at the Soviet Union would have been inevitable, and the world would have had to go through a real nuclear holocaust.

After the Cuban missile crisis had brought the two superpowers to the brink of nuclear war, both the US and USSR realized that nuclear war was not a topic conducive to a tête-à-tête on disarmament, to say the least. Nuclear nonproliferation had to be accomplished. Although the two superpowers were modernizing and increasing their nuclear arsenals to more than 30,000 apiece, they were in agreement that other states should be prevented from getting nuclear weapons. As it is impossible to conduct nuclear tests in a laboratory, the only way for a country to test a nuclear weapon was by exploding it in the atmosphere, in water or in outer space—a sure giveaway of its nuclear weapon capabilities. Thus, in 1963, the Partial Test Ban Treaty (PTBT) was signed and ratified, which prohibited nuclear tests in the atmosphere, outer space and water. The importance of underground nuclear tests were emphasized, despite the limited effectiveness of the technology to detect or monitor the results, and the two superpowers agreed to continue to hold them.
The US government assured the Senate that underground tests would be sufficient to assess the quality and capabilities of their nuclear arsenal.

In 1968, the Nuclear Non-Proliferation Treaty (NPT) was drafted at the Geneva Conference of the Eighteen Nations Disarmament Committee (ENDC) to prevent the emergence of any more nations with nuclear weapons. At the time, only five countries were in possession of nuclear weapons and even then, the results of their underground tests were not guaranteed. At that time, the primary target of the NPT was the industrial nations, although the lead of the US and the USSR was unmatched. It took several decades of negotiations at the likes of the first and second Strategic Arms Limitation Talks (SALT I and SALT II) in 1969 and 1972 respectively, the 1972 Anti-Ballistic Missile (ABM) Treaty, culminating in the Reagan-Gorbachev communiqué at the 1985 Geneva Summit and the 1986 Reykjavik Summit, before the two superpowers could agree that their nuclear capabilities were unmatched and to put an end to their nuclear arms race. A full ban on nuclear weapons was not possible however, with Gorbachev’s qualms over Reagan’s insistence over the strategic defense initiative (SDI). Small scale nuclear capabilities which could be exploited for terrorist purposes were mentioned but was not seriously taken up. They were not considered in part because nuclear weapons technology was expensive and complicated, whilst the “poor man’s nuclear weapon,”—chemical weapons—were negligible in effect and scale in comparison to nuclear weapons.

Gradually, the NPT review conferences concentrated on ways to create a new world political order, one that would prevent local conflicts from escalating into a nuclear confrontation or abuse by unauthorized rogue states or terrorists. It soon became clear that the in general, industrialized countries were not interested in developing nuclear arms for themselves and were using nuclear energy for peaceful purposes. This has resulted in a huge waste of time and effort for the IAEA as all nuclear facilities have to be inspected under IAEA safeguards, whatever their purposes: It was only the rogue states like Iraq or North Korea that were secretly trying to develop nuclear weapons.

The events of 11 September would suggest that the great powers were placing “improper biases” on what constituted weapons of mass destruction.

**Destructive power of nuclear weapons**

The US Government has carried out various case studies predicting the possible effects of nuclear war, some of which have been made public. In 1979, the report “The Effects of Nuclear War,” published by the Office of Technology Assessment (OTA), examined the effect of nuclear war on representative industrial cities in the US and USSR which could be hypothetical targets—Detroit and (then) Leningrad. The following are the main points of the findings:
1. The effects of a nuclear war that cannot be calculated are at least as important as those for which calculations are attempted.
2. The impact of even a “small” or “limited” nuclear attack would be enormous.
3. It is therefore reasonable to suppose that the extreme uncertainties about the effects of a nuclear attack, as well as the certainty that the minimum consequences would be enormous, both play a role in the deterrent effect of nuclear weapons.
4. There are major differences between the United States and the Soviet Union that affect the nature of their vulnerability to nuclear attacks, despite the fact that both are large and diversified industrial countries.
5. Although it is true that effective sheltering and/or evacuation could save lives, it is not clear that a civil defense program based on providing shelters or planning evacuation would necessarily be effective.
6. The situation in which the survivors of a nuclear attack find themselves will be quite unprecedented.
7. From an economic point of view, and possibly from a political and social viewpoint as well, conditions after an attack would get worse before they started to get better.¹

The study examined the effects of an initial Soviet attack on a US city (Detroit), followed by a US retaliation on a USSR city (Leningrad). The size of hypothetical attacks were: 1 Mt over both Detroit and Leningrad, as both the US and USSR in 1979 had this size in their arsenals; a 25 Mt over Detroit; a Mt over Leningrad; and 10 weapons of 40 Kt over Leningrad.

As an example of the effects, according to the report, a 1 Mt explosion on the surface of Detroit would leave:

a crater of about 300 m in diameter and 61 meter deep, surrounded by a rim of highly radioactive soil about twice this diameter thrown out of the crater. Out to a distance of 1 km from the center there will be nothing recognizable remaining…until 2.1 km, where a few very strongly constructed buildings with poured reinforced concrete walls will survive…²

The report continues to predict that during non-working hours, none of the 70,000 people within 2.7 km diameter of the explosion would survive. Casualties would be much higher during the working hours, resulting in fatalities of 130,000 and injuries of over 45,000. Depending on the distance from the explosion, casualty estimates ranged from 220,000 fatalities and 430,000 injuries for a 1 Mt explosion on the surface (S), to 470,000 fatalities plus 630,000 injuries for a 1 Mt air burst explosion (A). The corresponding numbers for Leningrad were 390,000 fatalities and 1.26 million injuries for 1 Mt (S) and 2.46 million fatalities to 1.1 million injuries for a 1 Mt (A).³
Chemical and biological weapons (CBW)

Although the OTA predictions were based on estimated calculations, they show the potential disastrous effects of a radiological WMD. Although chemical and biological weapons (CW and BW) will not have such a large-scale impact, recent developments in technology and increased proliferation mean that the number of casualties could dramatically increase.

The 1925 Geneva Convention prohibited the use of chemical weapons, except as a means of defense. When the level of chemical weapons deployed were at the level of the trenches in France during World War I, or by Egyptian forces in Yemen, or by Iraqis against Kurds, an extension of the Geneva Convention would have been enough to ban the production and possession of chemical weapons. Rapid progress in science and technology, however, has meant the development of new chemical agents which are highly toxic, including sarin, tabun, somon, and V-agents. Up to a point, the production process of sarin and tabun is the same as that of the common pesticide, produced all over the world but especially in the Middle East, which means that pesticide production could be easily diverted to sarin production. An extension of the Geneva Convention is clearly not enough.

These nerve gases do not have to be inhaled. If one microgram of these substances comes into contact with the human skin, the gases are absorbed into the body and attack the nerve system, stopping essential body functions such as breathing. The nerve gases are very potent chemicals so that one-gram of this gas can kill thousands of people. This is why it is classified as a WMD and is also referred to as the “poor man’s nuclear weapon” because, theoretically speaking, it can be easily diverted from the production of pesticides. At the same time, it requires highly quality laboratories and storing methods to keep these nerve gases at a pure and stable form in order to use them against well-defined targets. This was proved by the March 1995 Tokyo subway sarin attack, which was of very poor quality by the time it was released. Although 7 died and 2000 were injured the figure would have been much higher had the sarin been pure. One of the methods used, called binaries, is to produce two separate chemicals, which are mixed at the final stage to release the nerve gas. UN onsite inspections in Iraq revealed that the country had facilities to produce such binary systems and intended to deploy them using missile warheads. According to the United Nations Special Commission (UNSCOM), the Iraqi CW had been such that if they had been used, they would have killed the people launching the SCUD missile before they could hit the target.

Modern CW require delicate handling at all stages; need to be maintained at the correct temperature, density, and stability in order to operate at optimum conditions. Chemical warheads of missiles will have to go through supersonic speed, rotation, and heat and have to be designed to withstand such conditions. Clearly, the production of CW is not as simple as it may sound. One typical scenario of a CW attack is to mix the chemical with a vaporization control agent and target the missiles to enemy headquarters so that the deadly nerve gas would hover around
the headquarters for several hours, eliminating the command and control functions. As such a scenario has not been enacted it is difficult to determine the effectiveness bearing in mind the effect of changes in temperature, wind and other climatic factors. The use of nerve agents in the field are also difficult. The actual perpetrators will need to be completely covered and protected, but the protective gear and facemasks are cumbersome and difficult to manipulate during speedy war operations. It is difficult to assess the effectiveness of CW as they have not been fully tested on a large scale.

Biological warheads are more complicated and delicate to handle than CW, but because they are less conspicuous to release into society, they are potentially more lethal. If the attack is successful there is no doubt that they are WMD. Biological agents are living organisms that need to be maintained at a balanced and delicately controlled atmosphere. When biological warheads are launched, the heat, shock and speed of being hurled from a missile means that the biological agent may not necessarily produce the perpetrator’s desired effect. Another limitation of biological warheads is that biological agents need a conducive condition for in order to properly attack the intended targets.

Both CW and BW, but especially the latter, are lethal WMD which are better suited to terrorist tactics than a strategic exchange in an open battlefield. In addition to the physical harm, both CW and BW are likely to wreak havoc on society, especially due to the psychological consequences. It is possible that the changing circumstances of nonproliferation since the end of the Cold War, in which rogue states and local conflicts pose more of a threat than industrial countries, the proliferation of BW is more of a threat as a WMD than nuclear weapons. For example, the anthrax scare after 11 September killed few but put a tremendous stress on the national psyche of the US. Readers may find the anecdote of the Spanish conquest of Latin America illustrative, in which the native Indians were susceptible to the small pox unwittingly brought in by the Spaniards, whilst the conquerors with their home grown immunities were safe. According to the legend, this led the Aztecs and Incas to think that the “Spanish god was more powerful than the Aztec or Inca gods,” and thus, gave in to the ferocious conquest by the minority Spaniards.

**Preventive measures—export control**

The Nuclear Suppliers Group (NSG) or the old London Suppliers Group are export control groups. In a way, these arrangements were an extension of the Coordinating Committee on Multilateral Export Controls (COCOM) of the Cold War period as applied to WMD and their components. These are export control groups with guidelines on potential technology and components that could be used to build, operate and produce nuclear weapons related materials. These include the ability to produce enriched uranium, (or plutonium), by centrifuge or gaseous diffusion enrichment (the magnetic separation technology used by Iraq had not even been
classified because it had been considered too obsolete and ineffective). Another way to produce weapons grade plutonium is through the operation of natural uranium in heavy water or graphite moderated reactors. In order to avoid the use of reactor grade plutonium, the NSG also include such material as zirconium, which is a standard light water reactor (LWR) fuel cladding (also used for submarine propulsion reactors) on the list of products for export control. On the whole, the London Guideline had a history of being carefully observed, although there had been a number of notorious violations of the accords, especially by certain countries in West Europe and the Middle East.

The export of medium to long range missiles is also subject to control. The Missile Technology Control Regime (MTCR) was originally created in 1987 and now has 32 members. MTCR agrees not to export missiles with a range beyond 300 km and 500 kg warheads. In fact, the Al Hussein missile of Iraq, imported originally from North Korea and supposedly upgraded with South African and Egyptian cooperation, was above the MTCR limits. Both India and Pakistan have missiles above these limits while India is developing the Agni missile with a 2200 km range with a 1000 kg payload, while Pakistan is developing the Ghauri missile with a 1500 km range and a 700 kg payload.

North Korea’s missile capabilities are notorious with SCUD type missile exports to countries such as Iran, Syria and Pakistan. The Democratic People’s Republic of Korea, (DPRK) has the Nodong and Taepodong long-range missiles, which are, in fact, the focus of the theater missile defense (TMD) debate in East Asia. The August 1998 firing of the Taepodong missile over northeastern Japan heightened tensions even further. Israel’s Jericho missiles have both a 500km and 1500 km range, with more than 100 nuclear warheads. The difficulty of missile control is compounded by the fact that the outcome is uncertain: Even if the launch was successful, hitting the target is not guaranteed. Missile defense (MD) in general, require very complex and sensitive technology, whether it be national, theater, or ballistic missile (NMD, TMD, BMD), or theater high altitude area defense (THAAD).

On the export of chemical weapons and their ingredients, preventative measures are the domain of the Australia Group (AG) and the Wassenaar Arrangements. They deal with exports to a motley crew of rogue states. The control arrangements range from a “catch-all” requirement that covers all export items, to “know” regulations in which exporters in a position to know that the technology under question can be diverted are obliged to seek official export control (which is usually denied). Under the current circumstances, the application of these export control measures are not very clear.

**Individual cases of WMD**

**US and USSR**

In 1991, George Bush (senior) and Mikhail Gorbachev signed the Strategic Arms Reduction Treaty (START I) to reduce nuclear weapons. START I calls for the US
and USSR to reduce their nuclear weapons by 1600 strategic nuclear delivery vehicles (SNDVs) and 6000 “accountable” warheads. In 1993, START II called for limiting strategic warheads to 3000–3500 for both countries, with submarine launched ballistic missiles (SLBM) to 1700–1750. In September 1997, in Helsinki, the START treaties were amended to extend the final deadline to December 2007 and the general framework for START III was agreed upon. START III would further reduce the number of warheads to 2000–2500, although Russia already appeared willing to reduce to 1500 warheads. In November 2001, the US announced that 1700–2200 would be a feasible target but in actual fact, Russia may prefer a target of 1500. This is because, if the agreed target is higher, Russia may be forced to build a modern, but unnecessary, Delta-V nuclear submarines equipped with modern solid (yet uncertain) fuel SLBM, and being prevented from building a more convenient and capable SS-27 ICBMs. On the other hand, one major argument has it that the US could be sufficiently safe from nuclear attacks, as long as it does not insist on the first-strikes theory (which the US does not need), in order to destroy Russian first strike capabilities. In other words, if the US does not rigidly stick to every word of the nuclear deterrence theory, 1500 Trident D-5 missiles with an appropriate number of NMD will be sufficient to protect the country from Russian nuclear forces. It is worth noting that for both countries the target of 1500 warheads is almost like a saturation point in the START processes, beyond which the nuclear balance will be lost.

**North Korea**

The “experimental reactor” at the Yongbyon plant in North Korea has an estimated 5 megawatt (Mw) capacity, if burnt at 900 MwD/T, which is capable of producing several pits worth of weapons grade plutonium. The behavior of the North Korean regime defies logic and there are lingering doubts as to whether the DPRK has the capability to manufacture one or more plutonium implosion devices, however unlikely. According to the terms of the 1994 “Agreed Framework” signed by the Democratic People’s Republic of Korea (DPRK) with the US, the Korean Energy Development Organization (KEDO) was to provide North Korea with LWR in return for a complete nuclear freeze and dismantling of its graphite-moderated reactors. This would seem to have put the nail in the coffin of the DPRK’s nuclear ambitions but nothing is certain as opacity seems to be the motto of this regime. With the inclusion in the “Axis of Evil” January 2001 State of Union speech by President Bush and Kim Jong-Il’s subsequent announcement that the KEDO project would be cancelled, the situation seems dire.

**South Asia**

The 1998 nuclear tests conducted by India and Pakistan were widely reported and despite strong calls to join the NPT they are still non-signatories. It is not clear to what extent this fractious relationship influences the Chinese position, the Sino-
Indian relations, the Sino-Pakistani relations and India-Pakistan relationships and even on the problems of the famous “Islamic Bomb.” Relations in South Asia had been very rocky but the actions of Osama bin Laden on 11 September exacerbated the situation, adding another dimension to this unstable relationship. In any discussion on nuclear nonproliferation and regional security, it is clear that South Asia will be a focal point in the immediate future.

**Nonproliferation of WMD**

At present, several Nuclear Weapon Free Zones (NWFZ) and one Nuclear Free Zone (NWZ)—the South Pacific zone—exist. Both NWFZ and NWZ prohibit the production and possession of nuclear weapons, but whereas the NWFZ allows the peaceful application of nuclear devices under IAEA safeguards, the NWZ does not. The difference between the NWFZ and the NPT is that the latter does not prohibit the deployment of nuclear weapons whereas the former does. After the 1993 Chemical Weapons Convention (CWC), the Biological Weapons Convention (BWC) and the 1997 Comprehensive Test Ban Treaty (CTBT) were signed, the Geneva Conference on Disarmament has become stagnant. Issues including nuclear disarmament, prevention of arms race in outer space, the prohibition of the production of fissile material for nuclear weapons or other nuclear explosive devices (cut-off) remain on the agenda of the Disarmament Committee, but substantial negotiations have yet to take place.

**Changing concept of WMD**

The end of the Cold War hailed a potential end to the nuclear arms race, and the START processes are a reflection of that expectation. In the post-Cold War era, the rest of the world, and in particular the former members of the non-aligned movement, have given up criticizing the former superpowers for not observing the provisions of Article VI of the NPT on disarmament. In the 1970s, a quick and effective pro quo reduction of nuclear arsenal had been the objective of nuclear nonproliferation for the superpowers. Today, the notion that nuclear nonproliferation is in the interests of every nation has been tacitly, albeit not by all, accepted. Article VI of the NPT is still the symbol of WMD nonproliferation, but not as strongly as it used to be 20 years ago. The likelihood of the US and USSR to use nuclear weapons has diminished to such a level that it is near zero. What remains is a symbol. The real concern is that a mini nuclear crisis will erupt because of events in the nuclear hot-spots of South Asia or the politicking in the Middle East, or from the mischief of a rogue state or a terrorist. In order to reduce the diversion of missiles from the former Soviet Union (FSU) to these new nuclear hot-spots, the Cooperative Threat Reduction (CTR) Program, was introduced to provide financial assistance to the FSU.

The threats posed by rogue states are genuine but pale into comparison with the threat posed by idealists in possession of WMD willing to kill and die for their
cause: WMD proliferation between sovereign states that observe international law is limited to the region. There is tacit recognition amongst most members of the UN that the NPT is unfair but none are willing to challenge the provisions of Article VI. On the other hand, if regional conflicts are among entities that are not interested in obeying international codes of conduct, there is no way to stop them using CBW. Ethnic cleansing may lend itself to proponents of humanitarian intervention by the likes of the UN or the North Atlantic Treaty Organization (NATO). Thankfully, such cases have been few.

Nevertheless, preparedness for a totally unexpected attack à la 11 September, will now be a requirement for all citizens. For governments, preparation against the unknown threats is daunting but the most terrifying is how to build an effective defense policy against the acts of terrorism that defy rationale, especially ones with WMD capabilities. Terrorists beyond the reach of governments are the real threats. Before 11 September, terrorist acts ranged from Lockerbie, to Beirut, to Nairobi, to Oklahoma, to the first 1993 attack on the World Trade Center. The attack on 11 September raised the scale and whilst all terrorists have their own reasoning, they are far from reason. Thus, calls for a better intelligence service, one which is less dependent on technology than on human resources is understandable but at the same time, misses the point. The very nature of terrorist attacks meant that however vigilant, the disaster will be the work of the “one that got away.” Thus, although it is imperative that societies be prepared for a mini nuclear war by missile wielding terrorists, the gloomy truth is that it may not be possible to do so, even if a complete ban on all WMD could be achieved.

Man and war are tied in history but it was not until the eighteenth century that modern warfare meant an organized mobilization of men and arms. In the last 200 years, some of the development in science and technology has been used for destructive purposes, as better and more efficient methods of death were devised. Just as the world has come to realize that to stop a nuclear war, non-deployment should equal non-possession, the same is true of all warfare. This is, of course, easier said than done.

Notes

* Ryukichi Imai was Japan’s ambassador for disarmament in Geneva between 1983 and 1986. This article is an updated version of the paper on “Weapons of Mass Destruction, Evolution of the Concept in the Past 55 years,” presented at the UN Kanazawa Conference on Arms Control and Disarmament in June 2001.

2. Ibid., p. 27.
3. Ibid., figure 6, p. 37.