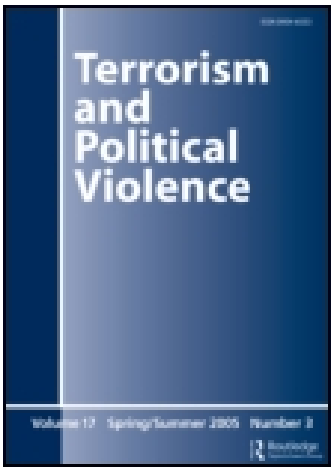

Terrorism and Political Violence

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/ftpv20

Terrorism and the use of weapons of mass destruction: From where the risk?

Alex P. Schmid [a]

[a] Taught sociology and political science at the Erasmus University and at Leiden University , The Netherlands

Published online: 21 Dec 2007.

To cite this article: Alex P. Schmid (1999) Terrorism and the use of weapons of mass destruction: From where the risk?, Terrorism and Political Violence, 11:4, 106-132, DOI: 10.1080/09546559908427535

To link to this article: http://dx.doi.org/10.1080/09546559908427535

11

Terrorism and The Use of Weapons of Mass Destruction: From Where The Risk?

ALEX P. SCHMID[1]

'The future may see a time when such a [nuclear] weapon may be constructed in secret and used suddenly and effectively with devastating power by a wilful nation or group against an unsuspecting nation or group of much greater size and material power'
– *Henry Stimson to Harry Truman, 25 April 1945*[2]

Introduction

There are some truisms about terrorism: one is that terrorism is a 'weapon of the weak'. Another is that 'terrorists want a lot of people *watching*, not a lot of people *dead*'. Both truisms, if they were true across the board, would indicate that the risk of terrorist use of weapons of mass destruction (WMD) is low. However, since the consequences of use of WMD are far-reaching – that tens of thousands if not hundreds of thousands of people can be killed in one single incident – one has to be alert to changes. Until now terrorist acts by non-state actors have usually killed less than one hundred people in a single event, with only a few exceptions where a hundred or more were killed. Table 1 illustrates this. If the past predicts the future, it seems that we would not have to fear much from non-state terrorists who, by and large, stick to their proven weapons, the dynamite bomb and the gun. Compared to the fatality figures of contemporary wars and genocide, the losses due to acts of terrorism, while tragic and traumatic on an individual scale, are modest.

TABLE 1
SELECTED HIGH FATALITY (>100) INCIDENTS, 1973–1998

1979: Arson in Abadan, Iran movie theatre	477
1983: Bombing of US marine barracks in Lebanon	241
1983: In-flight bomb explosion Gulf Air/737 Bahrain	112
1985: Bombing of Air India/747 off the Irish coast	329
1987: Car bomb in bus station in Sri Lanka	113
1988: Pan Am 103 in-flight bombing over Lockerbie	270
1989: In-flight bombing of French UTA/DC 10	171
1989: In-flight bombing of Colombian Avianca/727, Bogota	107
1993: One hour bombing campaign in Bombay	235
1995: Oklahoma City, Alfred P. Murrah Federal Bldg. bombed	168
1997: GIA-attributed massacre in Algeria's Relizane province	412
1998: Bin Laden-attributed car bomb in Kenya	213

Sources: US Congress, Office of Technology Assessment. *Technology Against Terrorism: The Federal Effort* (Washington,DC: GPO July 1991) p.40; R. A. Falkenrath, 'Confronting Biological and Chemical Terrorism', *Survival*, 40/3 (Autumn 1998) p.52; Brian M. Jenkins, 'Future Trends in International Terrorism', in Robert O. Slater and Michael Stohl (eds) *Current Perspectives on International Terrorism* (London: Macmillan 1988) p.254; PIOOM Database.

Will This All Change?

On 20 January 1999, the President of the United States said that he had been persuaded by intelligence reports that it was 'highly likely' that a terrorist group would launch or threaten a germ or chemical attack on American soil within the next five years. Bill Clinton said he hoped a major legacy of his Presidency would be to stave off such unconventional attacks. He added that he would be delighted if, decades later, Americans look back on any such threat as 'the dog that didn't bark'.[3]

Other governments, basing themselves on roughly the same raw facts for threat assessment available to the CIA, have reacted more cautiously. The recent American attempt to make the fight against terrorist attacks with weapons of mass destruction a prominent part of the new NATO strategy has not been embraced by America's NATO partners. All the American government was able to obtain in April 1999 on the occasion of NATO's 50th anniversary summit was a strengthening of NATO's intelligence service capabilities to detect plans for terrorist attacks, a larger staff at NATO headquarters to focus on this issue and an effort to educate the public about the growing threat of terrorists taking recourse to weapons of mass destruction.[4]

Is the Threat Growing?

The terrorist threat is a hidden threat and to assess the nature and seriousness of such a threat is difficult with, and especially without, access to classified intelligence. One of the changes in the terrorism of the last ten years is that terrorists no longer automatically claim credit (or what they used to call: 'assume responsibility') for an attack. Post-modern terrorism's anonymity feeds on one of the chief characteristics of what is currently called bioterrorism. Craig Venter, an American geneticist, noted in January 1999 that:

> There is no way we can easily distinguish between a bioterrorism event and an emerging pathogen [disease-causing microbe]. Virtually every human pathogen is something that can be used as a bioterrorism tool. We need better diagnostic tools to distinguish them.[5]

When one tries to address the risks of nuclear, chemical and biological terrorism one deals with an issue where one has to walk a fine line between fear and paranoia on the one hand and prudence and disbelief on the other. This new threat is one that, if consummated, can have grave consequences but is also one that is widely regarded as still being of low probability.

In the 1970s, one expert on terrorism, J. Bowyer Bell, could still write about the prospect of nuclear terrorism in these terms:

> The mix of motive, military and technological skills, resources and perceived vulnerability simply does not exist.[6]

And indeed, if one looks at the type of incidents between the mid-sixties and mid-eighties, one finds mainly ad hoc amateurish attacks against the nuclear power industry with a few cases of theft of nuclear materials, as illustrated in Table 2.

Chemical and bacteriological attacks, however, were rare (mainly food-poisoning) and produced few casualties until one religious group – Aum Shinrikyo (Supreme Truth), a millenarian Zen-Buddhist Japanese sect – had both a motive and the resources to execute chemical and biological terrorist attacks. Fortunately Aum lacked the military and technological skills to match its evil intent with capability (see Appendix 1 for a chronology of Aum incidents). This sect, responsible for the Sarin attack in the Tokyo subway in March 1995, was founded in 1987 by Shoko Asahara, and allegedly had, at its peak, more than 40,000

TABLE 2
NUCLEAR-RELATED INCIDENTS, 1966–1985, BY TYPE OF INCIDENT

Incident	N. America	West. Europe	Others
Kidnapping & Assassination	0	8	0
Theft & Smuggling	5	8	11
Bombing on-site location where nuclear material or equipment is present	9	24	9
Bombing off-site	79	30	4
Other attacks off-side	5	19	1
Other incidents	1	6	7

Source: Nuclear Control Institute in co-operation with SUNY's Institute for Studies in International Terrorism, 1986; cit. *The 1987 World Almanac* (New York, World Almanac 1997) p.35.

followers in at least six countries.[7] While Shoko Asahara, its leader, is still imprisoned, several key members are still at large while 170 Aum members released from prison returned to Aum.[8] The sect's Japanese membership, down to 500 after the March 1995 attack, has tripled again and is making money with selling 'survival kits' for Armageddon, songs of Shoko Asahara as well as computer merchandise.[9] It continues to have a website.[10] In early April 1998, there has again been a series of unknown gas attacks around Tokyo – in one incident 50 people fell ill – of which we do not know the authors. Apart from a series of attempted and usually unsuccessful attacks by Aum (see Appendix 1) uses of nuclear, biological and chemical weapons by terrorists are still rare, with hoaxes outnumbering actual deployment by far.[11]

What Are Weapons of Mass Destruction?

One does not require sophisticated weapons to kill many people. The Hutu genociders in Rwanda mainly used machetes to kill 800,000 Tutsis and moderate Hutus in less than three months in 1994. The Indian *thugs* killed one million innocent people during their 1,200 year long history of sacrifices to Kali (Shiva), the Hindu goddess of terror and destruction by mere strangling.[12] It was only in the Second World War that those weapons which we today call weapons of mass destruction (WMD) were systematically used. Chemical weapons (e.g. Zykon-B gas) were used by the Nazis against Jews, gypsies, Soviet prisoners and others; biological weapons were used by the Japanese

against the Chinese, and nuclear weapons were used by the Americans against the Japanese.

Chemical, biological and nuclear (fission or fusion) weapons are generally labelled weapons of mass destruction.[13] A fourth category is sometimes included under the label 'weapons of mass destruction' (WMD) – the still untested radiological weapons. There are considerable differences in lethality. Radiological weapons consist of a combination of conventional high explosives and radioactive materials like plutonium and can be used for the contamination of an area with radioisotopes. Such weapons have a considerable long-term area-denial potential but their short-term lethality is presumably low (so far there are no recorded uses). Chemical weapons demonstrated their lethality in the First War when they produced one million casualties, of which more than 90,000 were fatalities.[14] Nuclear fission weapons killed some 75,000 and 35–40,000 people instantly in Hiroshima and Nagasaki in August 1945. The much more lethal thermonuclear (fusion) weapons have so far never been used against human beings. Bacteriological (i.e. biological germ warfare) weapons have killed and injured possibly hundreds of thousands of people in China in the Second World War.[15] The potential of a bacteriological weapon, however, even surpasses a thermonuclear weapon which has a typical yield of 0.5 megatons (500 million tons of TNT – about 25 times the power of the plutonium bomb dropped on the people of Nagasaki). Both the USA and Russia had many weapons in the 9–20 megaton range until MIRV (multiple independently targetable re-entry vehicle) technology in the 1970s made such high-yield weapons obsolete (the highest-yield hydrogen bomb ever exploded was a Russian test weapon of 58 megatons – equivalent to almost 5,000 Hiroshima-size bombs).

Unlike thermonuclear weapons, biological weapons have been used in warfare. The awesome power of biological agents can be illustrated by three historical cases of which only two actually illustrate usage as a weapon of war:[16]

1. Plague: rat (rodent)–man transmitted disease, emerging from India and causing a first plague epidemic in China around 1330 where traders and Mongol armies spread it westwards.

Military use:

> 1346: Mongol Tatars catapulted plague-infested corpses into the beleaguered, Genoa-controlled, city of Caffa (Feodosia in

Crimea); pestilence broke out. The few survivors escaped by boat to Genoa where rats from the ship spread the plague in 1347. One quarter of the European population – more than 25 million people had died by 1349 from the 'Black Death'.

2. Smallpox (cowpox): caused by the highly contagious, person-to-person transmitted *variola* virus, kills about 20 per cent of all people contracting it. Wild smallpox has been eradicated world-wide since 1977; laboratory samples continue to exist and could be reactivated and used against a young generation not inoculated. There have been allegations by Ken Alibek, former Deputy Director of the 'Biopreparat' (non-Ministry of Defense portion of the Soviet BW programme), that the USSR produced large quantities of smallpox virus in violation of a 1972 international treaty forbidding this.[17] Smallpox immunity acquired by inoculation wears off after about 20 years. Today, most people are vulnerable again to smallpox, should it be used as a weapon.

Historical Role in Conquest of the Americas:

In the 16th century the (approximately) 75 million native American population had no resistance against European diseases like measles and smallpox. Within half a century, the population of Mexico was decimated from more than 30 million to less than 3 million Indians.

Military Use:

1754: Fort Pittsburgh, USA: Local traders in Pennsylvania create smallpox epidemic among Indians in western Pennsylvania by giving them blankets exposed to the smallpox virus. The Indians were decimated by the disease.

3. Influenza: Three types (A, B, C) of the flu (*la Grippe*) virus exist, plus variations. Symptoms are inflammation of the respiratory tract, fever and muscular pain.

Post World War I Epidemic:

The Spanish flu of 1918/19 killed in a few months an estimated 20 million persons – twice as many victims as had been killed in four years of warfare.

Weapons of mass destruction, especially biological and nuclear ones, are terrible no matter who uses them, whether non-state terrorists, state-sponsored or state actors. We have now been living for more than half a century under the threat of nuclear weapons of mass destruction. While there have been some tense moments such as the Cuban missile crisis, the 'balance of terror' between the Soviet Union and the West also created stability and predictability which is now looked back to with nostalgia in some quarters. The post-Cold War situation where weapons of mass destruction become within reach of non-territorial actors who cannot be deterred in the way that territorial actors can, creates an instability we have yet to learn to cope with. The superpower 'balance of terror', it is feared in some quarters, will be replaced by super-terrorism.[18] For super-terrorism, one does not need a nuclear weapon. An attack with a conventional weapon on a tanker carrying liquefied gas as it passes near a densely populated area could cause up to 50,000 fatalities,[19] about as many as could have died if the two Towers of the World Trade Center in New York had collapsed by the bomb placed in the garage underneath in 1993. The blasting of a large dam with conventional explosives could, in some parts of the world, kill over 200,000 people.

Ehud Sprinzak has distinguished between four different types of terrorism:[20]

1. Mass-casualty terrorism, like the failed attempt to down the World Trade Center in New York;
2. State-sponsored chemical or biological-weapons (CBW) terrorism whereby a rogue state passes know-how and funds to terrorist groups;
3. Small-scale chemical or biological terrorist attacks; and
4. Superterrorism – the strategic use of chemical or biological agents to bring about a major disaster with death tolls ranging in the tens or hundreds of thousands.

Sprinzak notes that these 'four types of terrorism are causally unrelated.'[21] That may be so. Yet we live in an age of networking and transnational criminal organizations (TCOs) might be the networker that could tie some of these types together.

Russian Perils

It has been said that the nuclear black market in the former Soviet Union is 'supply-driven' – that there are more sellers than buyers. That was true in the early years but it is not clear whether it is still true now. Germany saw an increase of cases of nuclear smuggling from 41 in 1991 to 267 in 1994, followed by a drop in 1995 (see Table 3).[22] This could mean two things: a greater control of the Russian and German authorities on the nuclear smuggling, or, more ominously, a greater professionalism of the smugglers with a declining detection rate. There are no clear signs that security at the nuclear facilities in the former Soviet Union where weapons-useable materials are located, has been significantly upgraded in the last few years. The fall in interceptions in Germany might also be due to a re-routing of smuggling materials to Turkey and other gates to the Middle East.[23] An indication of this is the rise in intercepts of substantial quantities of highly enriched uranium in Turkey in recent years.[24]

TABLE 3
NUCLEAR SMUGGLING CASES IN GERMANY

	1991	1992	1993	1994
Fraudulent	–	59	118	85
Believed True	–	99	123	182
Material Seized	–	18	21	19
Total Cases	41	158	241	267

Source: CSIS Global Organized Crime Project; cit. James L. Ford, 'Nuclear Smuggling: How Serious a Threat?', *Strategic Forum*, No. 59, January 1996 (Washington, DC: National Defense University, Institute for National Strategic Studies) p.5.

Why might TCOs be interested in drawing more attention from intelligence services to themselves when they can still make good money with smuggling drugs, and trafficking in prostitutes and refugees? One reason may be that they are already in the business of smuggling weapons and that some of the same contacts for conventional weapons from the arsenals of the Warsaw Pact also offer them unconventional weapons. Even if some of these organized crime syndicates cannot sell their nuclear wares: possessing some of that radioactive material might be a kind of life insurance for some groups when in trouble – they could blackmail themselves out of tricky situations if the heat is put on them.

Alternatively, possession of advanced biological and chemical weapons could allow a transnational criminal group to blackmail countries offensively. Yet beyond that there is a potential market, not only among rogue states but also among desperate national liberation movements and suppressed ethnic groups. Some TCOs are hybrids, half-criminal, half-political. Some groups like the Kurdistan Workers' Party (PKK) are involved in arms smuggling and drug and refugee trafficking and their criminal activities blend into their political ones, with the emphasis shifted depending on the exigencies of the moment. The same applies for Chechnyan groups in Russia.

The PKK has shown an interest in WMD. A former PKK bomb-maker allegedly claimed in 1997 that there had been efforts at preparation of Sarin, Potassium Cyanide and Mustard gas.[25] It is not inconceivable that in the present situation when Abdullah Ocalan, its leader, is in a Turkish jail, PKK members might try to blackmail the Turkish government to suspend the death sentence if indeed they really are in possession of such 'exotic' weapons. In desperate situations desperate people can do terrible things. There are some cases where desperation drove armed movements to the brink of use of weapons of mass destruction. Earlier this year I talked to a lady who was married to a physicist from Nigeria.[26] He was an *Ibo*, involved in the secessionist struggle of Biafra which costs two million lives between 1967 and 1970. This Biafran physicist and his colleagues allegedly managed to obtain enough radioactive material from Europe for a radiological bomb. There were plans to explode a radiological weapon in Lagos, the seat of the Nigerian government. However, on the way from Europe to Nigeria, the material became 'lost' in Portugal, never to be heard of again.

A radiological bomb is of course not the same thing as a nuclear fission bomb but it can create panic, though hardly causing mass casualties unless professional state actors with large quantities of plutonium get involved. Saddam Hussein was working on radiological weapons but so far we have only seen faint beginnings from the side of non-state actors. In March 1993 Chechens were reported to have obtained enriched uranium from Kazakhstan and from Russian Army depots. It was widely reported that the Chechens placed a small container with cesium-137 near the entrance of Moscow's popular Izmailov Park in November 1995 and notified a news agency which found the mystery cylinder with C-137 under the snow. It was clearly meant to convey the warning that the next time a more powerful

message would be delivered.[27] The container was probably stolen from a hospital where it was used for cancer therapy. Shamil Basayev and other Chechen commanders also threatened to attack Russian nuclear power plants. Before him, Chechen leader Dzhokhar Dudayev reportedly warned the US government in the summer of 1994 that he had two tactical nuclear weapons and that he would pass them to Libya if the United States did not recognize Chechnya's independence (the US government did not take this threat seriously).[28]

In the future, desperate armed movements like the Chechens and the Biafrans might possess more know-how, money and determination to take recourse to the 'ultimate weapon'. Intelligence circles have reported that the Tamil Tigers in Sri Lanka used gas in attacks on the authorities, though not against civilians. European intelligence sources also assume that the Algerian Armed Islamic Group (GIA) has acquired chemical weapons. Perhaps the moral of this is that we should not stare ourselves blind on small North-American militias, Japanese cults and European right-wing extremist groups when exploring the risk of use of weapons of mass destruction for terrorism. Terrorism with chemical, biological or radiological agents might soon no longer be the exclusive domain of states like Iraq which used VX, Sarin and Tabun against Kurdish villages in the Anfil campaign in 1988.

In the Hollywood movie *The Peacemaker*, a disgruntled Bosnian diplomat acquires a backpack-sized nuclear weapon and brings it to New York to explode it outside UN headquarters.[29] Is this so far-fetched? In June 1994 5.7 kilograms of uranium were found in the apartment of a former member of the Bosnian government in Austria. It was not however, a backpack, miniature bomb as in the movie. The Bosnians were desperate at the time: they were experiencing something bordering on genocide and nobody was giving them the help they needed. Already in November 1993 a *'Bosniac Front'* threatened to detonate nuclear explosive devices in European cities unless certain political demands of the Bosnians were met. While in this instance this was mere bluff, it might not always remain bluff in the future.

It might be prudent to focus more on such cases rather than on anarchist militias and religious sects like Aum Shinrikyo – though it should not be forgotten that a notebook found by the Japanese police from Aum contained a cryptic entry with the question '*how much would one* [nuclear device] *cost*?' followed by a price list – an enigmatic hint that an attempt might have been made to acquire nuclear weapons from

the Russian Federation (The cheapest Russian atomic weapon was, according to the notebook of Kiyohide Hayakawa, Aum's weapon-merchant, US$15m).[30]

Corrupt officials, profit-hungry firms and the mafia of the former Soviet Union are the most likely providers of non-conventional weapons. The Iraqis and Iranians both have attempted to procure nuclear materials from Russia. A tantalising element in this are those 84 (or, according to another account 10) 'loose Russian nukes', KGB suitcase bombs weighing less than 75 pounds Alexander Lebed first mentioned in 1997. The denials that emerged from Russia about these 'loose nukes' are evasive and contradictory. Some sources deny their existence altogether, and others admit that the USSR developed two types of suitcase bombs. While US government officials do not deny the development of these weapons by the Soviet Union, they are generally sceptical about allegations that some got 'lost'. However, there might be other categories of tactical Soviet nuclear devices one might have to worry about, including nuclear landmines and artillery shells.[31] Some of these tactical nuclear weapons apparently possess no safeguard system preventing unauthorized use (PAL).[32]

In addition to Russia (which is still reported as having more than 20,000 nuclear warheads – down from 45,000 in the mid-1980s) there are still significant quantities of weapons-grade (i.e. weapons-usable) material in Belarus, Georgia,[33] Latvia, the Ukraine (100 kilograms of highly enriched uranium), Uzbekistan and Kazakhstan. In Kazakhstan, according to one estimate, some 100 kilograms of Plutonium and 300 kilograms of uranium (reactor-grade HEU in pellet form) were said to exist.[34] According to another account, in Aktau, Kazakshtan, across the Caspian Sea from Iran, there are still three tons of plutonium stored.[35]

Why Should We Worry Most About the Soviet Legacy?

In answering this, there are, in my view, at least four reasons:

1. Nobody in Russia knows the exact quantity of nuclear materials produced during the Soviet era.[36] Estimates speak of about 1,500 tons of weapons-grade fissile materials and some 25,000 warheads.[37]
2. The security at the facilities storing weapons-useable nuclear materials and warheads is clearly deficient.[38] The originally high morale of the well-paid Russian troops guarding the nuclear sites

(their number has been brought down from 500 to a little more than 100[39]) might further erode and can then no longer be taken for granted in all cases. This has been highlighted by a series of thefts; in 1993 there were 27 cases of theft by insiders, according to the Russian Interior Ministry, a figure matched also in 1994.[40] In Murmansk, one Russian special investigator remarked with some exaggeration: 'Potatoes [are] guarded better than radioactive materials'.[41] Disgruntled, impoverished[42] guards and insiders can steal and try to sell weapons-grade and other radioactive material, and might be able to steal entire warheads.[43] In 1995 Russian law enforcement authorities admitted solving 21 cases of theft of fissile material since mid-1992, including at military facilities.[44]

3. There are Russian criminal organizations which have shown interest in such materials and which might soon access the 'closed' cities and other nuclear facilities and buy or steal nuclear materials.[45] In 1994, Ministry of Internal Affairs (MVD) sources claimed that 'some 35 to 40 suspected dealers in nuclear substances were operating around Moscow'.[46] Efforts by directors of Russian nuclear 'closed cities' to keep the mafia out might weaken in the future as living conditions in those cities deteriorate further. The United States currently provides grants to nuclear scientists in Russia to stop brain drain to rogue states but some of these programmes are badly administrated.[47]
4. There is much corruption in Russia[48] and border control is weak, especially in the South and the East which make smuggling such materials out of the country no great task.[49] In 1997 one attempt to smuggle nuclear materials across Russia's border made use of the immune diplomatic bag.[50]

Who is interested in Russian NBC (nuclear, biological and chemical) weapons? According to former MI5 director Stella Rimington, 'some two dozen governments are currently [1994] trying to obtain such [nuclear] technology. A number of these countries sponsor or even practice terrorism and we cannot rule out the possibility that these weapons could be used for that purpose'.[51]

Clients are both state and non-state actors. Here are some examples from PIOOM's Databank:

- In 1991 Islamic Jihad purportedly approached one of Russia's closed cities, Arzamas-16, offering to buy a nuclear weapon.

- In 1992 Iran unsuccessfully approached a plant in Kazakhstan with a request for enriched uranium.[52]
- In 1993, the director of the nuclear research centre in Arzamas-16 was, according to his own testimony, offered $2bn for a warhead by Iraqi representatives.[53]

Russia is not the only possible supplier – let us think of North Korea, India and Pakistan.

- Libya reportedly has offered to pay the entire national debt to India or Pakistan in exchange for nuclear weapons. This could have amounted to $10bn – if these two countries had not declined the Libyan offer.[54]

At the beginning of 1999 there were 23 ongoing high intensity conflicts (with more than 1,000 fatalities in the last 12 months), 67 low-intensity conflicts (with 100–1,000 fatalities) and 127 violent political conflicts (less than 100 fatalities in a year) going on. Table 4 illustrates this.

TABLE 4
NUMBER OF ARMED CONFLICTS BETWEEN 1995 AND 1998

	mid-1995	mid-1996	end-1997	mid-1998	end-1998
High-Intensity C.	22	20	17	16	23
Low-Intensity C.	39	31	70	70	67
Violent Polit. C.	40	44	74	114	127
Total	101	95	161	200	217

Source: PIOOM Databank, 1999.

These 217 armed conflicts have minimally two and often more conflict parties, including mercenaries, militias, death squads, terrorist groups and the like. Can we assume that they will all stay away from weapons of mass destruction if they are given a chance to acquire them on the black market? If one only looks at the US State Department's annual lists of transnational terrorist groups one finds not more than some 50 active groups. However, such groups identified as being of concern for the United States and some of its allies are but a small part of the total. More than ten years ago Jongman and Schmid listed and described more than 2,000 groups and organizations in more than 100 countries and territories in their 'World Directory of Terrorist and Other

Organizations Associated with Guerrilla Warfare, Political Violence, and Protest'.[55] An update of this global survey could be very helpful for determining which groups are most likely to use weapons of mass destruction for the purpose of creating terror?[56] The share of violent political conflicts, those most often associated with terrorism, has been rising in recent years as Table 4 makes clear.

Inhibitors and Facilitators

In 1986 an International Task Force on Prevention of Nuclear Terrorism concluded that due to a confluence of five factors the probability of nuclear terrorism was increasing. These factors are:

1. The growing incidence, sophistication and lethality of conventional forms of terrorism, often to increase shock value;
2. Evidence of state support, even sponsorship, of terrorist groups;
3. The storing and deploying of nuclear weapons in areas of intense terrorist activity;
4. An increasing number of potential targets in civil nuclear programmes – in particular facilities and shipments in which plutonium and uranium, in forms suitable for use in weapons, are present;
5. Potential black and gray markets in nuclear equipment and material.[57]

The fourth and the fifth of these facilitating factors have become more pertinent while there has not been much change in the first and third factors. The second factor has probably even declined. Nevertheless the balance between inhibitors and facilitators is shifting and the use of weapons of mass destruction by non-state actors can no longer be excluded.

As there are more actors and more violent political conflicts in today's world, the chances of proliferation of weapons of mass destruction and their threatened or actual use also increases. The number of serious incidents in PIOOM's database has been slowly growing but so far there has been no catastrophic terrorism from non-state actors. The one terrorist movement, Aum Shinrikyo, which has succeeded in developing impure Sarin, and tried its hand at VX and anthrax (though significantly, without success, as Milton Leitenberg's

discussion in this volume demonstrates), did not manage to produce or disperse these substances in an effective manner. The latter problem has also confronted a number of state actors before them.

The non or under-utilization of WMD for purposes of terrorism until now has been attributed to several factors:[58]

1. General reluctance to experiment with unfamiliar weapons.
2. Lack of familiar precedents.
3. Fear that weapon would harm the producer or user.
4. Fear whether it would work at all or, only too well.
5. Fear of alienating relevant constituencies and potential supporters on moral grounds.
6. Fear of unprecedented governmental crackdown and retaliation to them, their constituencies or sponsor states.
7. Lack of a perceived need for indiscriminate, high-casualty attacks for furthering goals of the group.
8. Lack of money to buy nuclear material on the black market.

These are indeed formidable inhibitors – but will they actually hold? Some of these inhibitors are certainly weakening. The Aum sect has, to some extent, created a precedent, opening, as it were, a Pandora's box. Lack of money is no longer a major obstacle for movements making many millions in the drugs trade. And there are even more facilitators:

1. Some of the current conflict zones (e.g. in the Caucasus) contain civilian nuclear facilities or research institutes that can be used for theft or fabrication of WMD.
2. The civilian nuclear industry produces huge amounts of plutonium,[59] which, if reprocessed, is no longer inaccessible to thieves. With regard to chemical weapons there are plenty of precursor substances available from civilian sources.
3. The information revolution (internet) in combination with the large number of physicists, chemical engineers and biologists has increased the likelihood of people getting access to critical information about how to produce not only explosives but also poisons.[60]
4. Organized crime has, in at least one case, already assisted in the procurement and transport of nuclear materials and chemical weapon materials have also reached terrorist actors.

5. Concealment and transport of some of these weapons is, due to their small size, relatively easy. Thermos cans, wine bottles and other ordinary objects can serve as containers for CB agents. Delivery of weapons of mass destruction is greatly facilitated by public access to the Global Positioning System which can guide small manned planes or unmanned drones with the deadly freight to target areas.[61] However, mundane delivery systems like express global parcel delivery services should not be excluded.
6. Urbanization has increased the chance of mass fatalities in the case of an attack.
7. Detection of the presence of some chemical and biological weapons – and there are many types – is often difficult and in many cases there are no known counter-agents.[62]
8. Great advances in genetic biotechnology have increased the chance of ethnic targeting whereby only another 'race' is affected by a biological weapon.

The last point opens a whole new dimension to biological warfare. A panel of the British Medical Association has recently concluded that weapons that can distinguish between ethnic groups by exploiting tiny genetic or cellular differences between them could be a reality within ten years. Rapid advances in genetics could create biological weapons as tools for carefully targeted terrorism. Such a development could take away one of the chief obstacles that has so far inhibited the widespread use of biological weapons – the risk of infecting oneself and members of one's own group. The Human Genome Project, an international effort to locate every element of the human genetic blueprint by the year 2003, could provide scientists with the genetic imprint of different ethnic groups, giving them a handle on how to attack one specific group only. The panel convened by the British Medical Association held that viruses and other micro-organisms tailored to detect the differences in the DNA of races could offer warmakers and terrorists of the future a new means to carry out 'ethnic cleansing'.[63] It is known that the Soviet Union did produce a genetically enhanced version of the anthrax bacterium in the 1980s. The hearings of the South African Truth Commission also revealed that there was a South African Biological weapons programme, in which scientists were asked to develop an 'ethnic weapon'. The background to this was that many white people in South Africa were, in the last years of Apartheid before the Cold War

was over, feeling desperate, despite the fact that they were a privileged minority. There are more endangered ruling elites who are ethnically or religion-wise different from the majority of the population. There are probably even more under-privileged desperate minorities who are determined and, in some cases also resourceful enough, to try to acquire and use WMD. The Biafrans, the Bosnians and the Chechnyans have tried to acquire nuclear materials. The Tamil Tigers and the GIA have shown an interest in gas weapons while Iraq, Iran, Libya and, to a lesser extent Taiwan (until stopped by the USA) have tried hard to acquire NBC capabilities. Desperate people and their leaders might indeed do desperate things. Desperation is certainly an issue towards which we must look above all else when trying to assess from where the threat of use of weapons of mass destruction is most likely to come.

Defence Against Terrorist Use of WMD

Weapons of Mass Destruction in the hands of non-state actors pose several problems.[64] The smallness of some of these weapons (especially the biological ones) makes detection en route to the target very difficult. The anonymity of such an attack can make retaliation blind and prior deterrence difficult. Target hardening is difficult, except for specific high-security areas. Improving intelligence capabilities is an obvious requirement but this faces new challenges of nearly unbreakable encryption and instant satellite communication. Control over precursor materials and better guarding of storage sites are called for but the former suffers from the fact that many of these precursor materials are dual-use substances. Technical and tactical solutions go only some way towards dealing with the threats of weapons of mass destruction in the hands of people not bound by interests of state and fear from massive retaliation. The main emphasis of counter-terrorism against weapons of mass destruction has to be elsewhere.

The best defence is not to give offence. Continuous constructive dialogue and pragmatic compromise with actual and potential political opponents at home and abroad must be sought in order to prevent unilateral or mutual demonization and dehumanization which is one of the preconditions for mass murder with a 'clean' conscience. With the given limitations of physical deterrence, there is no effective substitute for conflict prevention. Once escalated, compromise in conflict is often less sought than victory or, if that is not achievable, desperate but

glorious defeat, slamming the door of history, as it were, with a bang. Wherever there are desperate groups, peoples and states in the world they must be offered alternatives to suicidal gambles. A broad but soft psychological conflict resolution approach rather than a hard high-tech counter-insurgency approach is more likely to succeed. In the meantime there are some measures that should be considered:

1. Intelligence collection priorities ought to focus more strongly on proliferation issues and on desperate actors (declining liberation movements, millenary religious sects, paranoid racist groups and chauvinist nationalists) likely to be tempted to acquire WMD.
2. The trade in (precursor) materials for chemical, biological and nuclear substances must be subjected to better monitoring and greater control.
3. Existing Conventions in the field of NBC weapons, terrorism and organized crime must be strengthened by adding (better) monitoring, implementation and sanction mechanisms.
4. International co-operation to counter proliferation and terrorism must be enhanced and bureaucratic red tape and turf fighting have to be dealt with by creating more flexible and intelligent organzations.
5. Existing government stockpiles of NBC weapons must be better guarded and accounted for, and gradually be phased out and destroyed. A credible, multilateral NBC disarmament programme by governments might (after some time) put moral pressure on non-state actors to refrain from the acquisition of such weapons.

These are time-consuming measures and not quick technical fixes like some of the measures currently proposed (mass inoculations, filter systems in water and air ventilation systems). The temptation to look for merely technical solutions and protection systems will undoubtedly be great and one must be aware that the current threat exaggeration is apparently being fuelled by an industrial-advisory complex in this area. An over-estimation of the threat posed by terrorists using weapons of mass destruction will only increase the incentive to acquire such threatening weapons among crazies and crusaders who thrive on attention and, in some cases, prefer to be wanted for mass murder rather than not be wanted at all.

Conclusion

Any use of weapons of mass destruction is terrorizing, no matter whether state-actors or non-state actors are involved. Policies to stem the proliferation of such weapons should therefore also be preferably applied across the board. Pleas for addressing the root causes are often dismissed as unworkable as there are supposedly too many causes. However, if we take desperation as an important root cause why certain actors – state and non-state – might take recourse to weapons of mass destruction, this considerably narrows the field. Desperation is, however a late signal on the conflict escalation ladder. What we need is a better reading of 'early warning' signals of situations that might induce some groups of people – and some states – to reach for the 'ultimate weapon'.

APPENDIX I
Chronology of Aum Shinrikyo Incidents

Aum Shinrikyo, a millenarian Zen-Buddhist Japanese sect, was founded in 1987 by Chizuo Matsumoto (born 1955), an almost blind man from the south of Japan. The sect, which allegedly had links with the Yakuza, claimed to have more than 40,000 members in at least six countries, most of them in Japan and Russia. Aum Shinrikyo, after being unsuccessful in politics, decided to develop weapons of mass destruction. It recruited hundreds of students in the field of advanced science and set up an international network to acquire materials for use as weapons of mass destruction. Its leader, Shoko Asahara, planned to use violence as a catalyst to bring about the apocalypse (in which only members of the sect would be granted mercy). They killed at least 27 people, partly by poison (inc. nerve gas), partly by conventional methods of murder. Other Aum members who wanted to leave the sect 'disappeared' and might also have been killed. In total Aum made nine attempts to use bio-chemical weapons. The following incidents are derived from various sources (inc. the Kaplan and Marshall volume) integrated in PIOOM's Database.

1. 1990, April. Members of Aum drove a car around the parliament in Tokyo with the exhaust pipe outfitted to disseminate what was supposed to be the botulinum toxin. This was the first of a dozen attempted

biological and chemical weapon attacks – most of them, like this one, a failure – by Aum in the following years. Another failed attack involved the US installation in Yokohama, yet another the naval base at Yokuska and one at Narita Airport. Aum planned to put the blame for the resulting fatalities on the American military in Japan. However, they went unnoticed.

2. 1993, early June. Aum Shinrikyo used a specially equipped car to spread the botulinum toxin they thought they had created in downtown Tokyo. The goal was to disrupt the planned wedding of Prince Naruhito, Japan's Crown Prince.

3. 1993, 28 June. Aum Shinrikyo members attempted to disseminate what they believed to be anthrax from the roof of an eight-story Aum-owned building in eastern Tokyo, beginning on June 28, 1993. Local authorities received over 200 complaints from neighbours about the odour of the white fumes coming from the sect's building. The police did not bother to investigate. Earlier Aum members had tried to spray downtown Tokyo with what they thought to be botulinum toxin, without noticeable results.

4. 1994, Spring. Shoko Asahara tried to kill Daisaku Ikeda, leader of a rival Buddhist sect, with Sarin nerve gas dispersed by an industrial sprinkler fixed to a truck. The attempt failed and wounded Aum's chief of security, Tomomitsu Niimi, whose life was saved by the application of the counter-poison PAM. Subsequently Aum tested the Sarin on a flock of 29 merino sheep on their Australian ranch at Banjawarn Station.

5. 1994, 27 June. In Matsumoto (200,000 inhabitants), Japan, two members of Aum Shinrikyo, under the direction of Masami Tsuchiya, head of Aum's chemical unit, tried to release Sarin nerve gas from a truck near the judicial building of the city, killing seven people and injuring 150 (other sources speak of 250), including three judges who were the real target (they survived). The goal was to preclude a negative judgement in a land dispute matter.

6. 1994, 27 June. Seven people died and 264 were injured after a mustard gas accident in Satian No. 7, the chemical weapons factory of Aum. The substance injured technicians in the Aum laboratory and then

drifted into a residential area in a mountain resort north-west of Tokyo. Asahara Aum was later held responsible.

7. 1994, July. Villagers in Kamikuishki, Japan, complained about a strong odour coming from the Aum compound at the base of Mt. Fuji. Police later found evidence of Sarin production in the soil near the compound. (Pure Sarin is odourless but Aum's smelled like rotten vegetables, in the recollection of one victim).

8. 1994, 2 December. Aum attacked Noboru Mizuno, a 83 year old man who had given shelter to five women who had managed to escape the sect. The sect's attack on him involved a hypodermic needle that, supposedly, contained VX. He survived after ten days in hospital.

9. 1994, 12 December. Aum attacked Takahito Hamaguchi in Osaka with a hypodermic needle containing VX for being suspected as a police spy. He died two days later in hospital.

10. A journalist, who wrote a story connecting Aum with the Sakamoto family murder, became the victim of a phosgene gas attack in her residence. Sakamoto, a lawyer, the founder of an association of victims of Aum Shinrikyo, was killed with his wife and child by a commando of Shoko Asahara in November 1989.

11. 1995, 15 March. Aum Shinrikyo members, fearing police persecution in the near future, planted three briefcases designed to release the botulinum toxin in the Tokyo subway. The briefcases were modified with vents and battery-operated fans. However, the individual responsible for filling the packages apparently had second thoughts about the morality of what he was engaged in and substituted the toxic material with a non-toxic substance. The failure of this attack led to the Sarin attack five days later.

12. 1995, 20 March. Aum Shinrikyo launched an attack aimed at killing some 40,000 personnel from government offices and the National Police headquarters on their way to work on the Tokyo subway system: five simultaneous Sarin nerve gas releases took place on trains heading for Kasumigaseki Station, killing 12 persons and injuring more than 5,500 people (of whom 1,200 had to be hospitalized). The attack,

hastily planned and using impure Sarin and a primitive dispersion device (a bag punctured by an umbrella tip), caused copycat crimes, some causing hundreds of casualties, particularly in the Yokohama area. There were also several more completely unsuccessful Tokyo subway mass-killing attempts with hydrocyanic gas by members of the Aum Shinrikyo sect.

13. 1995, 22 March. Japanese police raided 25 Aum properties and found enough chemicals to kill an estimated 4.2 million people. They also confiscated a Russian-made helicopter and a poison gas detector. Later, the police found a library of biochemistry books, incubators and an electron microscope.

14. 1998, December: 'Satian No. 7', the chemical weapons factory of Aum Shinrikyo in Kamikuishiki (Yamanashi Prefecture, Japan) where more than 100 engineers and technicians had first produced Sarin nerve gas in November 1993, according to the so-called Russian procedure, was dismantled and has become the first chemical production facility destroyed under the United Nations Chemical Weapons Convention (which has so far been signed by about 170 nations (ratified by 121)). Source: PIOOM Database WMD.

NOTES

I would like to thank Milton Leitenberg (University of Maryland) for critical comments and suggestions. Views and opinions expressed in this article, however, are my sole responsibility and not necessarily shared by him.

1. Professor A. Schmid is currently on leave from the Synthesis Chair on Conflict Resolution at the Erasmus University in Rotterdam. This article was written before he joined the United Nations as Officer-in-Charge of the Terrorism Prevention Branch. The views and opinions expressed in it are those of the author and in no way reflect positions of the United Nations.
2. Cit. Roberta Wohlstetter, 'Terror on a Grand Scale', *Survival*, XVIII/ No. 3 (May–June 1976) p.98.
3. Judith Miller and William J. Broad, 'Clinton Describes Terrorism Threat for 21st Century', *New York Times*, 22 January 1999.
4. Bert Steinmetz, 'VS verliezen bij nieuwe Navo-strategie', *Het Parool* (Amsterdam), 11 March 1999, p.7. France, in particular, was opposed to focus NATO efforts on threats from the North-African and Middle East 'NATO periphery'. The war in Kosovo of course changed the nature of that meeting.
5. 'Calls to stockpile vaccines against rise of bioterrorism', *The Independent*, 25 January 1999.
6. J. Bowyer Bell, 'A Time of Terror' cit. Augustus R. Norton, 'The Threat of Nuclear Terrorism', *National Defense*, 19 December 1980, p.12–F.

7. D. Kaplan and Andrew Marshall, *AUM. De Sekte aan het Eind van de Wereld* (Amsterdam: Uitgeverij Luitingh 1996) opposite p.192.
8. *New York Times*, 20 March 1998; cit. Pinkerton's Daily Intelligence Summary 24/03/98. The cult had most of its following in Russia; one of the Russian members was working at the Kurchatov Institute, a nuclear physics laboratory. Center for Strategic and International Studies. *The Nuclear Black Market* (Washington, DC: CSIS 1996) p.16.
9. *Times of India*, 4 April 1999.
10. AUM's Website is: <http://aum-shinrikyo.com/english/index.htm>.
11. Bruce Hoffman noted: 'Indeed, of more than 8,000 incidents recorded in The RAND Chronology of International Terrorism since 1968, only 52 evidence any indication of terrorists plotting such attacks, attempting to use chemical or biological agents or to steal, or otherwise fabricate their own nuclear devices'. Bruce Hoffman. 'Responding to Terrorism across the Technological Spectrum' Paper (St Andrews University: 15 July 1994) p.1.
12. The religious cult of the *thugs* that terrorized India until the mid-19th century had its members lie in wait on holy days throughout the year for innocent travellers who were ritualistically strangled. The victims were supposed to go to paradise as no blood had been shed in the act of strangling. Bruce Hoffman, 'Religious Extremism' in M. Crenshaw and J. Pimlott (eds.), *Encyclopedia of World Terrorism, Vol. 1* (Armonk, NY: M.E. Sharpe, Inc. 1997) p.211.
13. Weapons of mass destruction are often defined as 'Nuclear, biological and chemical weapons and the means to deliver them.' Col. Guy B. Roberts, 'Nuclear Weapons-Grade Fissile Materials. The Most Serious Threat to US National Security Today?' *Airpower Journal* (Special Edition 96) p.9.
14. Organization for the Prohibition of Chemical Weapons, *Chemical Disarmament. Basic Facts* (The Hague: OPCW 1998) p.2.
15. Other fatality estimates are lower. Cf. Sheldon H. Harris, *Factories of Death* (London: Routledge 1994). The Japanese germ warfare specialists of Unit 731 at Ping Fan (built by General Shiro Ishii) used anthrax, typhoid, plague and other pathogens. R. Blumenthal, *World War II Atrocities: Comparing the Unspeakable to the Unthinkable*, New York Times on the Web, 7 March 1999.
16. These examples come from the PIOOM Database on NBC agents and weapons as are all the other subsequent examples cited in this article. Due to the limited number of past cases (some 300 items are in the PIOOM database) history can offer only limited guidance in this area.
17. Ken Alibek testified to the US Congress that through the end of the 1980s the Soviet Union had produced 'hundreds of tons of anthrax weapon...along with dozens of tons of smallpox and plague'. He said that he was 'convinced' that Russia's biological weapons programme 'has not been completely dismantled'. David Brown, 'Destruction of Smallpox Samples is Reassessed. Some Suspect Virus Also Exists in Secret', *Washington Post*, 15 March 1999, p.A–1.
18. The issue of definition of terrorism is not addressed in this article. I use two definitions, a social science definition and a minimum legal one:
    1. Social Science Definition: 'Terrorism is an anxiety-inspiring method of repeated violent action, employed by (semi) clandestine individual, group or state actors, for idiosyncratic, criminal or political reasons, whereby – in contrast to assassination – the direct targets of violence are not the main targets. The immediate human victims of violence are generally chosen randomly (targets of opportunity) or selectively (representative or symbolic targets) from a target population, and serve as message generators. Threat- and violence-based communication processes between terrorist (organization), (imperiled) victims, and main targets are used to manipulate the main target (audience(s)), turning it into a target of terror, a target of demands, or a target of attention, depending on whether intimidation, coercion, or propaganda is primarily sought'.

2. Proposed legal one: Terrorist acts should be considered as 'peacetime equivalents of war crimes' (i.e. deliberate attacks on civilians; hostage-taking; killing of prisoners). Cf. A. P. Schmid, *The Definition of Terrorism. A Study in Compliance with CTL/9/91/2207 for the UN Crime Prevention and Criminal Justice Branch* (Leiden: COMT, January 1993).
19. Bernard L. Cohen, 'The Potentialities of Terrorism', *Bulletin of the Atomic Scientists* 32/2 (June 1976) p.35.
20. Ehud Sprinzak, 'The Great Superterrorism Scare', *Foreign Affairs* No. 112 (Fall 1998) p.116.
21. Ibid., p.117.
22. Center for Strategic and International Studies, *The Nuclear Black Market* (Washington, DC: CSIS 1996) p.4.
23. This is a conclusion that can be drawn from the substantial NBC material intercepts since 1993 in Turkey. Cf. Ali M. Koknar, 'The Trade in Materials for Weapons of Mass Destruction', *International Police Review*, No. 134 (March/April 1999) pp.24–25.
24. Personal communication from police source.
25. Koknar (note 23), p.25. The veracity of the PKK claim is questionable.
26. I have known the source of this story for some years and trust it.
27. Roger Medd and Frank Goldstein, 'International Terrorism on the Eve of a New Millennium', *Studies in Conflict & Terrorism* 20 (1997) p. 293. It should be noted that the veracity of the Izmailov incident is not uncontested.
28. Andrew Cockburn and Leslie Cockburn, *One Point Safe* (Washington, DC: Doubleday 1997) pp.101–103.
29. UN Headquarters have been targeted before. On July 22, 1948 peace activist Stephen J. Supina dropped a home-made dynamite bomb on the UN headquarters in New York (no damage was caused and Supina later surrendered).
30. D. Kaplan and A. Marshall (note 7) p.240; United Nations, ECOSOC. Commission on Crime Prevention. Fifth Session, Vienna, 21–31 May 1996. 'Links between Transnational Organized Crime and Terrorist Crimes', report by the Secretary-General, p.3.
31. Joseph W. Foxell, Jr., 'The Prospect of Nuclear and Biological Terrorism', *Journal of Contingencies and Crisis Management* 5/2 (June 1997) p.98.
32. PAL stands for 'Permissive Action Link', a locking system that is means to prevent unauthorized use.
33. In the mid-1990s the British government sent in a special team to secure nuclear materials in Georgia when instability made it likely that it could fall into wrong hands.
34. Center for Strategic and International Studies, *The Nuclear Black Market* (Washington, DC: CSIS, 1996) p.11.
35. William Potter (Director Center for Non-Proliferation Studies at the Monterey Institute of International Studies) cit. Thalif Deen, 'Disarmament: UN Moves to Curb Nuclear Terrorism', *Inter Press Service*, World News, 1 February 1998, p.2.
36. W. Potter who toured the former Soviet Union looking at the safeguarding procedures reported: 'Most of this stuff has never been subjected to a physical inventory...it is impossible to say how much of the material may or may not be missing', *Nando Times News* 2/11/1998. Scholars worry that 'loose nukes' could end up in Mafia hands.
37. CSIS (note 34) pp.1, 20n.
38. The quality of Russian safeguarding of nuclear materials is a source of worry. In the words of Col. Guy B. Roberts: 'Security is more lax at most Russian nuclear facilities than at many ordinary office buildings in the US'. The chairman of a National Academy of Sciences panel that recently studied the problem of plutonium disposition observed firsthand the continuing deterioration of basic custodial and control arrangements over fissile materials, commenting that 'Any day now we could wake up and read in the newspaper that enough material for a dozen bombs really has been stolen...', A Bette Hilman, 'US and Russia Face Urgent Decisions on Weapons Plutonium', *Chemical and Engineering News*, 13 June 1994, p.14; cit. Guy B. Roberts (note 13) p.2.
39. Karl-Heinz Kamp, 'Nuclear Terrorism – Hysterical Concern or Real Risk?' *Aussenpolitik (German Foreign Affairs Review)* 46/3 (1998) p.5.

40. CSIS (note 34) p.11.
41. Cit. Col. Guy B. Roberts (note 13) p.2 (the material in question is fuel for nuclear submarine reactors (which is HEU) which is fabricated at military facilities). This material is less critical in terms of terrorist abuse than actual warheads. With regard to the latter, Russian officials often paint a picture as if all was well. One highly-placed knowledgeable Russian source told me that Russian nuclear weapons were controlled every fifteen minutes by remote sensing. On the other hand the former director of the CIA, John Deutch, told US Senator Sam Nunn during hearings on proliferation of weapons of mass destruction, that 'a knowledgeable Russian has told us that, in his opinion, accounting procedures are so inadequate that an officer with access could remove a warhead, replace it with a readily available training dummy, and authorities might not discover the switch for as long as six months', cit. CSIS (note 34) p.1.
42. 28.6 per cent of all Russians – 42 million people – lived in late 1998 under the poverty line of 573 rubbles ($35) per month. Poverty rose by 2.2 million in one year, AFP, Moscow, 20 November 1998; cit. *NRC-Handelsblad*, 20 November 1998, p.5.
43. CIA Director John M. Deutch testified before the Permanent Subcommittee on Investigations of the US Senate on 20 March 1996: 'The military is now facing a crisis situation in housing, pay, food, manning levels, and social services, all of which have resulted in plummeting morale and lapses in discipline. Although nuclear weapon handlers traditionally were among the best treated and loyal in the Russian military, they are now suffering hardship similar to those of the rest of the armed forces'. Cited on the WWW at <http://www/odci.gov/cia/public_affairs/speeches/archives/1996/dci_testimony_032096.html>.
44. CSIS (note 34) p.11.
45. To quote once more John M. Deutch (20 March 1996 Testimony before Senate Committee): 'We estimate that there are some 200 large, sophisticated criminal organizations that conduct extensive criminal operations throughout Russia and around the world. These organizations have established international smuggling networks that transport various types of commodities. Many of these groups have connections to government officials that could provide them access to nuclear weapons or weapons-grade materials and enhance their ability to transport them out of the country. In fact, various reports suggest that there are vast networks, consisting of organized crime bosses, government officials, military personnel, intelligence and security service officers, as well as legitimate businesses. These networks would have the resources and the know-how to transport nuclear weapons and materials outside the former Soviet Union' – note 43, p.6.
46. Rensselaer Lee, 'Post-Soviet Nuclear Trafficking: Myths, Half-truths, and the Reality', *Current History*, October 1995; cit. CSIS (note 34) p.17n.
47. Jessica Stern, *Risk and Dread: Preempting the New Terrorist* (Cambridge, Mass.: Harvard University Press 1999); cit. from flyer of US Institute of Peace, Washington, DC, 7.
48. David Satter and Richard Aldacushion, 'The Rise of the Russian Criminal State', *Woodrow Wilson Int. Center for Scholars Knowledge in the Public Service* 1/2 (December 1998 – January 1999) p.16. According to Satter, $350bn was sent out of the country illegally over the last decade. According to Louise Shelley, author of *'Stealing the Russian State'*, at least 40 per cent of the $2bn that leave Russia each month must be attributed to criminal groups. The Red Mafia is said to control more than 40 per cent of the economy (Hans Buddingh, 'De witwasserij', *NRC Handelsbald*, 13 maart 1999, p.18).
49. To quote from J. Deutch's testimony again: 'The breakup of the Soviet Union has resulted in the breakdown of the institutions that kept many smugglers and questionable traders out of this region. The pervasive control once exerted by a combination of the Soviet KGB, the Soviet military, and the Soviet border guards no longer exists. Even before the breakup, however, some of the southern borders, especially with Afghanistan, were penetrable. According to anectodal information from recent travellers to these areas, anything can go across the borders in these countries for a minimal price.

Travellers have discussed bribing border guards with as little as a bottle of vodka to allow them passage without papers, to as much as a few hundred dollars to arrange for a carload of goods and travellers to cross without inspection or questions. There is little hard evidence to support the plethora of unconfirmed reports and anecdotal information that this region [Central Asia and the Caucasus, AS] has been a source of proliferation concern, but weapons of mass destruction-related materials – to include weapons-grade fissile material and other radioactive materials, nuclear and missile technology, and scientific expertise – are present in the region, and the potential for diversion exists. There is no evidence that existing narcotics transit routes are being used to smuggle nuclear materials. The fact they are well established and successful, however, leads us to believe that they easily could be used for nuclear diversion', J. Deutch, 20 March 1997. Testimony before the Permanent Subcommittee on Investigations of the Senate Committee on Government Affairs by the DCI, John M. Deutch (note 43) p.3.

50. According to Valery Draganov, chief of the Russian State Customs Committee (GKT), Moscow, *Itar Tass*, 26 January 1998 (WJIN News, 28 January 1998).
51. Joseph W. Foxwell, Jr. (note 31) p.99.
52. US Under-Secretary of State for International Security Affairs, Lynn Davis, accused Iran of trying to obtain nuclear arms by stealing the materials and technology needed to construct atomic weapons. She said: 'We have reason to believe that the Iranians are looking to see whether they can find means to augment the development of their own capabilities. If they succeed they can reduce the time needed for developing a weapon dramatically', *Muslim News*, 1996, p.13. There are reports (believed in Israel and disbelieved in the United States) that Iran may have purchased four intact nuclear weapons – or more likely, all such a bomb's hardware except the nuclear-core material itself – from Kazakhstan when confusion resulting from the USSR's breakup in 1991 was widespread, *Intelligence Digest*, 1996, p.3; cit. Joseph Foxwell, Jr. (note 51) p.99.
53. Rensselaer Lee, as quoted in CSIS (note 34) p.15.
54. Oleg Bukharin, *The Threat of Nuclear Terrorism and the Physical Security of Nuclear Installations and Materials in the Former Soviet Union*, Monterey, Center for Russian and Eurasian Studies, August 1992, p.16.
55. A. P. Schmid and A. J. Jongman, *Political Terrorism. A New Guide to Actors, Authors, Concepts, Data Bases, Theories, and Literature,* revised, expanded and updated edition prepared under the Auspices of the Center for International Affairs, Harvard University (Amsterdam: North-Holland Publishing Company 1988).
56. 'The purpose of terrorism is to create terror', Lenin used to say. However, acts of atrocity can also be used for creating panic, for blackmail, extortion, coercive bargaining and propaganda. The use of weapons of mass destruction is, however, almost by definition, terrifying.
57. Nuclear Control Institute, *Report of the International Task Force on Prevention of Nuclear Terrorism*, Washington, DC, 25 June 1986, p.1.
58. List is partly based on Ron Purver, 'Chemical and Biological Terrorism: The Threat According to the Open Literature', *Canadian Security Intelligence Service*, June 1995, p.7.
59. Col. Guy B. Roberts writes: 'Growing stockpiles of civilian or reactor grade plutonium in Western Europe and Japan alone will be sufficient for 47,000 bombs. According to one reliable source, most of the world's 1,000 tons of plutonium are in civilian hands and yet only 30 per cent (Britain, France, and the non-nuclear weapon states) is under international safeguard. And while plutonium use will be uneconomical for the next 30 to 50 years, billion dollar reprocessing plants in Britain and France continue to reprocess and separate an average of 21 tons of plutonium a year', G. B. Roberts (note 13) p.4.
60. Precursor materials are sometimes readily available. According to one author, 'ball-point ink is only one chemical step away from Sarin', Mullin, 1992, pp.108–109; cit. R. Purver (note 58) p.4.
61. Aum Shinrikyo bought two small radio-controlled unmanned helicopters which could be used for spraying crowds with toxic substances. They also had bought a full-sized

Russian Mi-17 helicopter in June 1994; it could be fitted with 128mm rockets, four Scorpio anti-tank rockets and 12.7mm machineguns on its nose, D. Kaplan and A. Marshall (note 7) p.242.

62. R. Purver (note 58) p.8.
63. 'In genetic terms there are more similarities between different people than there are differences. But the differences exist, and may singly, or in combination, distinguish the members of one social group from another', Aisling Irwin, Science Correspondent. 'Genetic science "could be used for ethnic cleansing"', *ISSUE*, 22 January 1999; Charles Arthur, 'Germ Warfare "could target ethnic groups"' *The Independent*, 22 January 1999.
64. There is also great variety among terrorist actors. The following list identifies ten different actors.

Types of Non-State Actors associated with Acts of Terrorism

1. Millennarian cults. Example: Aum Shinrikyo.
2. Islamic fundamentalists. Example: Osama bin Laden.
3. Left-wing groups. Example: Iran Mujahideen Khalk Organization (MEK or MOK).
4. National liberation movements. Example: PKK (Partiya Karkaren Kurdistan).
5. Transnational Criminal Organizations (TCOs). Example: Chinese Triads.
6. Right-wing and Racist groups. Example: Death Squads in Colombia; Militias in USA.
7. Revengers. Example: the 'Armenian Scientific Group' (which threatened to destroy Turkey's largest cities by nuclear devices – a hoax).
8. Single issue groups. Example: US anti-abortionists.
9. 'Ecoterrorists'. Example: Animal rights groups.
10. Mad scientist. Example: The Unabomber (who only used conventional explosives).