

TERRORISM AND WEAPONS OF THE APOCALYPSE

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On 20 March 1995, *Aum Shinrikyo* startled the world by launching a nerve gas attack in the Tokyo subway. Many felt that terrorists finally crossed a threshold by producing and using an apocalyptic weapon, the “poor man’s atomic bomb” as the literature so often suggests.¹ A second conclusion was that the *Aum* confirmed a belief widespread among students of terrorism that religious groups are particularly attracted to these weapons.

The first conclusion, that a threshold has been crossed, runs wildly against the facts. No one in the near future is going to see cities destroyed where tens of thousands die. Conventional explosives, like those used to create the Nairobi or Oklahoma City atrocities, will continue to inflict the overwhelming bulk of the casualties. The plain fact is neither chemical nor biological weapons presently are truly weapons of mass destruction in the way atomic weapons are; and they are certainly not so in the hands of terrorists.² Misreading the *Aum Shinrikyo* experience, *inter alia*, could waste tens of billions of dollars.³

With respect to the second conclusion, we have closed the book too quickly on who might be attracted to these weapons. The historical record indicates secular groups have sought to use such weapons more often than religious groups. This will likely continue into the future too.

DIFFICULTIES IN DISCUSSING THE PROBLEM

Before we turn to the reasoning, it will be useful to explain why this issue is so difficult to discuss. First, one cannot say much that is either new or certain about the matter, partly because there have been so few incidents, and we know so very little about those events. Groups gathered materials and sometimes made threats to use them but they did not employ them, and we do not know why.⁴ Beyond the absence of information, there is a second problem. We are dealing with

a frightening and very remote possibility, but one which, alas, can neither be demonstrated nor disproved. Just as there is no logical way to show religious believers they are in error in thinking the world will come to an end, so likewise no way exists to demonstrate terrorists will never use apocalyptic weapons. Because of this uncertainty, the issue moves out of the academic realm gaining serious and potentially pernicious consequences.

Elsewhere, I have discussed religious believers who want an apocalypse to occur in order to redeem the world.⁵ Here I want to talk about two other types, those who fear the apocalypse or simply see it as an unprecedented catastrophe, and those who exploit that anxiety for their own mundane purposes. Apocalyptic expectations have consequences because of certain propensities in human nature. If you want people to pay attention to uncertain but dangerous matters, you *must* exaggerate. The fact was driven home to me for about the twentieth time in late July 1998. The Discovery Channel was planning a program on terrorists and weapons of mass destruction. The producers discussed details with me in several conversations, and I thought the deal for my presentation was nailed down. A week later London called asking, "By the way what is your general view of the problem?"

"A frightening thought," I said, "but not a serious possibility now."

"Oh dear" came the response, and a pregnant silence ensued. That ended the call, and I am still waiting for the baby.

Another way to think about our propensity to exaggerate disaster is to ask yourself, which position would you as an analyst prefer to be in? Is it better for your reputation to predict that grim events will happen and be wrong, or is it better for your professional credentials to be optimistic about disaster and equally wrong. All things being the same, the consequences of error would be much greater for the optimist and, therefore, the prudent analyst will be grim. This fact after all is the logic insurance policies are based on, a profitable economic activity. There are other consequences of the propensity to prepare for the worst, beyond good business for insurance salesmen. Consider a 7 August 1998 front page story in the *New York Times* that described the workings of a panel which recommended the government spend \$420 million over five years (\$51 million in the first year) for vaccines and antibiotics against a possible terrorist attack.⁶ Scientists, business men, and policy makers completed the task in record time because they could overwhelm "doubters" and "side-step objections." The panel made bad and costly decisions, and it is necessary to reconsider the whole problem again. "Cheaper more effective vaccines" seem likely in the "next few years" and, in any case, the facilities to produce the initial vaccines ordered are not available.

The major problem in dealing with biological and chemical attacks is that

so many different toxins and pathogens can be used, and since a vaccine for one is not useful for another, it is economically impossible to stockpile for all potential agents. The story noted also that since there is money to be made, problems were exacerbated by those with conflicting interests. No wonder a well-known analyst of terrorist activity, Larry Johnson, noted in the *US News and World Report*,⁷ that this particular antiterrorism anxiety is the “latest gravy train,” one which academics, government bodies, and business corporations are all eager to board. It is one thing to buy insurance with your own money; it is another to urge insurance with someone else’ money, especially if the insurance salesman will make a personal profit on what he sells and that fact is not obvious to the purchaser who thinks the advice is impartial.

A second psychological disadvantage associated with this issue stems from the conflict between serious students of terrorist experiences and those from the physical sciences. Physical scientists are more impressed with the dangers because they are more clearly aware of the potential of chemical and biological agents and the ability of science to increase the powers of those agents. In addition, the authority of physical scientists is intimidating, especially to the untrained.

Nonetheless, those of us who have been in terrorists studies for a long time are likely to be skeptical for the simple reason that we know there have always been enormous gaps between the potentiality of a weapon and the abilities and/or will to employ it. Terrorists, in particular, operate in contexts of enormous uncertainty and anxiety; accidents fatal to the terrorists are plentiful, and to avoid them terrorists seek simple weapons that are easy to transport and assemble.⁸

CONFLICTS BETWEEN CONVENTIONAL WISDOM AND EXPERIENCE

Since the 1960s, when terrorism re-emerged as a serious concern, there has been an unhealthy tendency to exaggerate the importance of technology in explaining the phenomena, a tendency which is reflected in our explanations of all violent struggles.⁹ Because of that tendency, many have been mystified that terrorists have not been interested in the various chemical and biological toxins and pathogens readily available since the First World War. The conventional explanation for this restraint, or mystery if you like, is that terrorists have been political animals who know full well that these weapons would alienate their potential constituencies.

However, in recent years the nature of terrorism has changed because religious objectives replaced secular or political ends for many groups,¹⁰ and many commentators are certain religious terrorists will be attracted to chemical and biological weapons as moths are to a flame. Why? Because religious terrorists are only interested in serving their deities and are oblivious

to human constituencies. And there are other reasons too. Religious believers have much less concern for their lives in this world; they will accept risks secular terrorists refuse to take, and they are, we often read, consumed by the idea of sheer destruction. The revelation that *Aum Shinrikyo* was a religious group seemed definitive proof of this connection between religion and chemical and biological weapons, a connection which creates a doomsday problem for us all. But a closer look both at the historical record and at the *Aum* experience suggests a more ambiguous picture.

The historical record: States

Who has used chemical weapons, why, and to what success? Undeniably, the principal users have been states; and while there are significant differences between states and terrorist groups, there are some generally ignored parallels in their experiences well worth pondering.

In the twentieth century, chemical weapons were used by both sides in the First World War and by Italy against the Ethiopians in the 1930s. More recently, Iraq employed them first against Iran, and then against Iraqi Kurds. Egypt's Nasser employed them in Yemen, and Libya under Qaddafi experimented with them in Chad. Perhaps 30 states today have chemical weapons.¹¹

States have used chemical weapons, but they did so rarely, a potentially very significant fact, and one to which we shall return after considering the military circumstances encouraging states to use them. The evidence is that the temptation is greatest in situations where a military stalemate has developed, a deadlock which desperate belligerents want to break.

Ironically, despite the belief that there may be a decisive weapon they do not seem to be very effective on the battlefield, especially when appropriate defensive measures are available. The weapons have blunted an offensive; but it is very difficult to find that tactical advantage being transformed into a decisive strategic one, because in the cases familiar to us the original stalemate and/or war of attrition continued.¹² This pattern, so often repeated in history, occurred again in the best documented recent use of chemical weapons during the long Iran-Iraq War.

Iraq employed this weapon only in vital segments of the front and only when it saw no other way to check Iranian offensives....
(C)hemical weapons...had a negligible impact on the war limited to tactical rather than strategic (effects).¹³

Iraqi gases killed 5,000, but the Iranians suffered 600,000 dead altogether. Gas, thus, killed less than 1%.¹⁴ By far the deadliest experience with gas occurred during the First World war, but still it accounted for only 5% of the casualties and those gassed were more

than 10-12 times likely to recover than those wounded by traditional weapons.¹⁵ These facts help us appreciate the supreme irony Amos Fries and Clarence West propose after examining the First World War experience, “Instead of being the most horrible form of warfare, it is the most human, because it disables far more than it kills, i.e. has a low fatality ratio.”¹⁶

It is also worth remembering that Iraq’s use of chemical weapons against Iran was a violation of international law but oddly, in a view of present American concerns, Iraq was not named as a culprit in United Nations resolutions. Apparently at that time, the matter did not seem very important.¹⁷ The West developed a different view after the Gulf War, and in 1997 Secretary of Defense William Cohen indicated U.S. military superiority was so great potential adversaries, unable to compete in conventional arms, may feel compelled to use apocalyptic weapons in a struggle against the United States.¹⁸

Why did Saddam Hussein decide not to use gas in the Gulf War? The conventional wisdom is that he feared the nuclear response that was threatened. That certainly may be correct. But it is also true, and possibly more pertinent, that the experiences in the Iranian War could not make him confident that his chemical weapons had military value, and the potential significance of this fact is much overlooked.¹⁹

Consider, too, another fact relevant to the argument. Chemical weapons were used more often after the Second World War than during the inter-war period. There are no technological improvements to explain this difference but there are some good relevant military reasons. After 1945 more wars of attrition were fought; and they have been fought largely between Third World armies which generally lack serious offensive capabilities. Most can fight only in trenches, and trench warfare is always attrition warfare.²⁰

States have been the principal users of biological weapons too, and although available for a much longer period of time than chemical weapons they have probably been used less often. The Republic of Venice used biological weapons in the fifteenth and sixteenth centuries, as did the English in the French and Indian War (Seven Years War). Venice was attracted largely because poison seemed ideal for assassination strikes; the illness induced was likely to be considered as a product of natural causes thus making Venetian involvement easier to conceal. The English, on the other hand, were interested in the potential for large scale destruction when they attempted to spread small-pox among the Indian tribes supporting the French. Later, the weapons were used for both ends. It is difficult, oddly, to find states using biological weapons for religious purposes, and this is true in spite of the fact religious wars are traditionally reputed to be the most ferocious. The fact should also be interesting for those concerned with possible use by terrorists because it is assumed religious terrorists are

“naturally” attracted to those weapons.

Japan’s military efforts offer the most modern, comprehensive, and interesting examples of chemical and biological activities, but we can only discuss the second here.²¹ Starting in 1932, Japanese scientists experimented with many different biological weapons, and created production facilities with “a potential for creating sufficient bacteria to kill the world’s population several times over,” and the experiments on prisoners killed some 3,000.²² Japanese records describe some 11 attempts to use the weapons spreading “germs of cholera dysentery, typhoid, bubonic plague, anthrax disease, and paratyphoid” through water supplies and air drops from the 1930s through the end of the war.²³

Considering the reputed potentialities of Japanese materials, they were used very infrequently most likely because they did not live up to expectations or were very impractical weapons, producing relatively few casualties against armed forces. There were also difficulties in controlling diseases generated and the cost could be as great to the attacker as to the attacked. In the assault on Chekiang (China 1942), Japanese toxins occasioned 10,000 Japanese casualties, including 1,700 deaths. The Japanese program’s principal defect, a problem common to all efforts so far, is an ineffective delivery system, a usable shell, bomb, or spray.²⁴ Biological and chemical weapons have similar military rationales. An adversary believing himself to be at a great disadvantage at a crucial moment is sorely tempted to consider chemical and biological weapons. The British in western Pennsylvania (1754) had few troops and inadequate supplies. The historian Francis Parkman noted that

terror reigned supreme.... The Indian scalping-parties were ranging everywhere, laying waste the settlements, destroying the harvest and butchering men, women, and children, with ruthless fury.

If Fort Pitt was lost, the frontier would be forced back some 200 miles to Lancaster, “forfeiting many years of colonization.” Desperation inspired the British to try to create a smallpox plague among the Indians.²⁵

The Japanese initially developed their biological program because they anticipated that a much larger Soviet Union would try to expel them from recently conquered Manchuria. The major Japanese biological strike (Chekiang) came after the Doolittle Raid, the first attack on the Japanese homeland and a very serious psychological blow. The Japanese hoped to destroy the area containing Allied airfields. When that strike backfired and generated so many self-inflicted casualties, the biological program was virtually abandoned.

The limited value of effectiveness of chemical or biological weapons in wars

of the past, seems the most compelling reason they were not used much, a possibility usually ignored, or at least obscured. Discussions of the weapons take their deadlines for granted. Most offer two reasons only to explain why attacks are so infrequent, namely the intense moral revulsion they arouse and the fact that the states threatened are able to retaliate with similar weapons.

Technological innovations, like the ballistic missile, could render the issue of military ineffectiveness moot. Still, for most countries missiles are very expensive and unreliable. General Norman Schwarzkopf says the Scud missile in the Gulf War was the military equivalent of a mosquito.²⁶ The fact is that weapons designed solely to inflict casualties and not break organization – the object of battle – cannot be decisive as a military weapon.²⁷ In any case, the issue of what history can and cannot teach us should be joined, and rarely is.

The historical record: Non-state actors

Now let us look at the experiences of non-state actors, especially those of terrorist groups. We will treat chemical and biological attacks together. As noted above, states have not used these weapons often, a pattern which is even more striking when we examine terrorist groups. According to a Central Intelligence Agency report, 40,000 international terror incidents occurred between 1968 and 1980, but only 22 had chemical or biological elements. For every two thousand incidents, nearly one chemical and one biological event occurred. The casualties are also less per incident.²⁸ Another surprise: by far the overwhelming number of attempts are inspired by criminal purposes, and of those which served political ends most were political and very few religious.²⁹

One striking example of a non-state actor was a group of about 150 Jewish partisans from Poland. In the aftermath of the Nazi defeat, this group of survivors sought to avenge the Holocaust before the Allies decided to prosecute Nazi war criminals. A plan to poison the water supplies of 4 German cities, killing some 2 million Germans, was frustrated at the last moment by British intervention. Next, an effort to poison the bread of nearly 40,000 interned SS men was made; although a thousand were poisoned, apparently none died. Attacks ceased when the Allies announced plans to prosecute Nazi war criminals.³⁰

In 1978 the Palestine Liberation Organization (PLO) began to poison Israeli oranges in European markets, injuring 12 and seriously damaging the Israeli economy. But then the activity stopped, and we do not know why. There are some claims that in the same period the PLO in Lebanon trained the German Red Army Faction (RAF) and others to use chemical and biological weapons. Stasi (East German intelligence) apparently was also training groups at the same time. The RAF stole a cache of mustard gas and promised to poison water supplies; and in November 1980, in an RAF apartment in Paris, French police dis-

covered a miniature factory where both a botulism culture and notebook with instructions about how to spread bacterial disease had been produced.³¹

In 1984 a Fatah official threatened chemical attacks against Israel. At the same time the Covenant, Sword and Army of the Lord (CSA) a right wing religious terror group in Arkansas procured 30 gallons of cyanide. A neo-Nazi group, Order of the Rising Sun, produced 80 pounds of typhoid bacillus. *Rajneeshee*, a Hindu religious group in Oregon, poisoned 750 but none died. It still is unclear why the RAF, Palestinians, and neo-Nazi groups never used the materials they had and/or threatened to use. Were they restrained by moral, political, or organizational concerns? We do not know, and a number of the instances have not been seriously examined.³² Beyond the activities we know happened, there is an unknown, indeed unknowable, number of others who for some reason or another aborted their plans.

AUM SHINRIKYO

Given our anticipation of what nerve gas might do, knowledgeable persons should have been very surprised that so little damage had occurred. And we should be surprised also that other groups have not yet followed suit. A “copy-cat” phenomena usually follows apparently novel acts of violence, and that fact led a CIA National Intelligence Estimate (1984) to predict although chemical and biological weapons were not yet popular among terrorists who were still terrified of them, “one successful incident would significantly lower the threshold of restraint.”³³

Looking more closely at the *Aum* experience, several unique features suggest *Aum*'s attack is not the decisive turning point conventional wisdom has been expecting. *Aum* contained some 20 scientists with graduate degrees, and its laboratories were so good that the chief chemist said he left the university because *Aum*'s facilities were better.³⁴ *Aum* apparently began its efforts in 1990, 5 years before the notorious subway attack. Its assets were valued at one billion dollars and it had some 50,000 members world-wide. Because *Aum* was a religious group, Japanese law placed serious obstacles on police inquiries even though *Aum* members had murdered several individuals, including members of the group. Finally, with no previous experience of groups exploring chemical or biological agents, the police ignored complaints about awful odors coming from the main commune. Despite all these advantages, which no terrorist group ever had or perhaps ever could have, *Aum*'s record as a terrorist group was poor.

The subway incident captured our attention. But *Aum* made nine attempts before and then two attempts after the major subway incident. Twelve attacks but none succeeded, and ultimately *Aum* itself was crushed. All this suggests that successful chemical and biological efforts are much more difficult than conventional wisdom suggest, at least

now, and that the “poor man’s atomic bomb” remains costly and unreliable. Perhaps *Aum*’s failures will discourage others; if not, prospective users are unlikely to match *Aum*’s efforts, let alone exceed it.

There are other pertinent details. In the first eight attempts, *Aum* tried to use biological toxins believed to be more destructive than chemicals. A gas thought to be deadly was developed in 1990, and *Aum* sent three trucks to attack the U.S. installation in Yokohama, the naval base at Yokuska, and Narita International Airport. But the three trucks caused no damage, and nobody even *noticed* the incidents because the gas *Aum* developed was not lethal.

Aum next attempted to develop an anthrax bomb and released it on two separate days, first from a truck and then from a Tokyo sky-scraper. Again, nobody noticed, no damage was reported; despite the expectation of its scientists, *Aum* failed to create a deadly weapon. After four such attacks, *Aum* abandoned biological weapons altogether. It turned to chemical weapons, and made two sarin gas assassination attempts. An *Aum* scientist was the only casualty. The lesson drawn was to dilute the gas to protect *Aum* members. Despite the common wisdom that religious believers are indifferent to personal safety needs, *Aum* was very concerned with such details and developed anti-sarin pills as well.

Prior to the big subway attack, there was a strike against a court building to prevent a case against *Aum* from being heard. *Aum* hoped to kill three judges but it only injured them, as an unexpected wind blew the gas in another direction to kill six and injure 600. *Aum* next tried an aerosol sprayer attack on the subway, on 15 March 1995, but the person filling the container became conscience stricken and put water instead of sarin gas into it. Five days later the big subway attack came which riveted Japan for nearly a year getting more attention than the Kobe earthquake, which preceded it and killed approximately 6,000 people. Finally, *Aum* rushed into both subway attacks before the group was read to attack in order to divert the police on its trail. The two initial subway attacks were followed by two more subway assaults, one with cyanide, but both were aborted. A U.S., Congressional sub-Committee opined that if an undiluted dose was used in the 20 March attack, some 10,000 people might have died.³⁵ Perhaps, but *Aum* felt the dilution was necessary to protect its carriers, and like so many terrorist organizations it was in flight when it struck, a circumstance where accidents and misjudgments are common and a circumstance which provided another reason to dilute poison. It is striking, too, that every death was occasioned by direct contact with the liquid and none by the gas.

It is unlikely that *Aum* was exceptionally inept. Estimates of Irish Republican Army (IRA) casualties produced by accidents, as opposed to those inflicted by security forces range, from 40% to 56%, and this happens when

Comparatively easy to use explosives are employed over and over again and handled, thus, by veterans.³⁶ Remember, too, the IRA has been active longer than any comparable group, and therefore, presumably, is efficient.³⁷

In an essay I wrote many years ago I tried to explain the paradox of why ancient terrorist groups were more destructive and durable than their contemporary counterparts. One reason was the simplicity of the weapons which made decisions easier, and accidents less likely in situations of great uncertainty. It is pertinent perhaps, too, that of the many delivery methods devised by *Aum*, the most effective was the most primitive, namely releasing the gas by using sharpened umbrellas to penetrate the plastic containers. What is true for terrorists has some relevance for soldiers too. How else can we explain that artillery rounds were responsible for most casualties in the all wars of the last two centuries.³⁸

What does the *Aum* experience tell us about the difference between religious and secular groups? Not as much as some would believe. Certainly, secular groups have been attracted to these weapons. The Avengers failed, but genocides may provoke more disastrous reactions in the future.³⁹ The PLO and RAF seemed to be on the verge of using chemical and biological weapons just because their other weapons failed.

There was, however, an interesting unique odyssey in *Aum*'s development. It did not react to a devastating atrocity and did not try other weapons first. It began as a political party, and after a humiliating defeat in the 1989 parliamentary elections, it immediately began to experiment with biological pathogens as its first weapon. One might even say that it was obsessed with pathogens and toxins. If so, why? Most have said that such activity is especially attractive to religious elements who have no restraints on their destructive appetites. Perhaps, but something else was more crucial. *Aum* worshiped Shiva, the Hindu god whose consort Kali inspired the Thugs, perhaps the most deadly terrorist group in history. As stranglers, the Thugs killed without shedding blood believing that those who died in this way would go to paradise, a doctrine which made killing easier for the killer. This doctrine is found in *Aum* too. If this is the source of *Aum*'s fascination with gas, then it is not religion per se, but rather the type of religion that is most critical here, and presumably in other cases too.⁴⁰

IMPLICATIONS AND CAVEATS

Scholarship

There are few facts and cases available, and all speculations on apocalyptic weapons are on shaky grounds. Still, we can know more. We had to wait until 1998 before we got the first good efforts to analyze reported cases from open sources, when Seth Carus and the Monterey Institute of International Studies both found various instances with conflicting or incomplete evidence.⁴¹ Chemical weapon efforts analyzed are largely in the United States. Even in cases we know some-

thing about, there are gaps particularly with respect to why individual groups have been attracted to apocalyptic weapons, and why they decided to abandon materials once gathered.

Terrorism, furthermore, has a long history stretching back at least to the first century, and the weapons employed have varied from period to period. But we have no account of how and why new weapons become part of the terrorist arsenal, how quickly innovations are transmitted to various groups and what the obstacles to the transmission might be. Changes in tactics represent a virgin field for inquiry.⁴² Finally, we have barely begun to scratch the surface on target selection.⁴³

Priorities and Money

Nonetheless, there are good reasons to think terrorists can not produce doomsday catastrophes – yet. Aum had extraordinary time, much money, many scientists, and wonderful cover. Still, in 12 attempts it only occasioned 13 deaths, including two Aum members, while hospitalizing 1,200. Compare this record with a 1984 CIA report which said the “clandestine production of chemical and biological weapons for multiple casualty attacks raise no greater technical obstacles than does the clandestine production of chemical narcotics or heroin.” The statement was repeated on 15 November 1998 by Secretary of the Navy William Danzig who went on to say that “a single leased airplane disbursing a biological weapon can kill more people than died world-wide in any month in World War II.” One wonders who is living in what world?”⁴⁴

Since 1970, 12 chemical and biological attacks have occurred in American, producing 1 fatality and 772 injuries, almost all minor.⁴⁵ Seth Carus’ study of biological attacks world-wide contains interesting information. Excluding military efforts, 70 biological attacks, including 18 terrorist, have occurred since the beginning of the twentieth century, occasioning nine deaths and 985 casualties. Forty-five of those attacks have occurred in the last decade which indicates great interest now in biological weapons however unimpressive the demonstrated capacities to use those weapons are.⁴⁶ Certainly capacities can become better, but so can counter measures. Japanese police now investigate religious groups, now anticipate chemical and biological conspiracy possibilities, and apparently abandoned traditional propensities to negotiate endlessly.⁴⁷ States can supply terrorists with materials. But states have so much to lose by giving such power to agents that cannot control, that this is a very remote possibility, and not one that has been attempted.

The question is how much should one spend for remote possibilities, when other perhaps more pressing and certainly more real dangers exist? A program to prepare every defense for every possible chemical or biological strike can be very expensive and irrelevant. One can stockpile vaccines and anti-biotic treatments for ten toxins

only to discover that one we have not prepared for is the one being used. The 1998 attack on the U.S. embassy in Nairobi taught us that the government did not have enough money to protect all embassies; and it seems that attacks with explosives are not only more likely but more deadly too. Before throwing more money at the problem, clear priorities should be established for U.S. counter-terrorism policies.

Panic and Confusion

The absence of clear direction leads to confusion and sometimes panic. In the 1996 Olympics, everyone was preparing for chemical and biological attacks, and it is conceivable this pre-occupation hampered the ability to handle the conventional bomb explosion which did occur. The odd, unprofessional behavior of FBI agents in a February 1998 Nevada press conference announcing they had arrested persons with anthrax – which lab tests the next day revealed to be a vaccine – suggests that the agents had panicked. If government agents panic when apocalyptic weapons are suspected, how can we expect the population to remain calm? Television interviews where public officials describe how many people a vial of anthrax will kill terrify, but do they enlighten? Simulated exercises in which tens of thousands die do not provide the basis for sound useful policies. Worst case scenarios which highlight only potential vulnerabilities are bound to have effects on those who wish to terrify and those who can be petrified. In Los Angeles at the time of this writing (January 1999) some 20 anthrax threats, costing over \$100,000 each, have been made in the past two months, a virtual epidemic which could intimidate a public and them make it blasé to all reasonable possibilities. One doubts whether this is the “copy-cat phenomena” anticipated by government authorities.

We lack a sense of history, or at least a belief that something can be learned from experience. Without that link to experience, our sense of proportion dissipates. This gap is a problem which pervades those strange people who think one needs an apocalypse to get to paradise and it is evident too among ordinary people who simply see apocalypse as hell itself.

ENDNOTES

¹ One government study, for example, claimed that in some scenarios involving chemical and biological weapons “the level of sophistication required may be lower than was the case for sophisticated bombs that have been used against civilian aircraft.” Office of Technology Assessment, *Technology Against Terrorism: The Federal Effort* (Washington, DC: Government Printing Office, 1991), 57.

² It is not clear to me why and how chemical and biological weapons, which have been available for some time, have recently designated “weapons of mass destruction” along with nuclear bombs. Certainly, the history of three weapons indicates clearly that they are vastly dissimilar with respect to destructive capabilities. I have, therefore, avoided using the term weapons of mass destruction when referring to chemical and biological toxins. See John and Karl Mueller’s perceptive and provocative essay, “Sanctions of Mass Destruction,” *Foreign Affairs* 78:3 (May/June 1999): 43-53. The Muellers compare casualties inflicted by various weapons and show how the recent reshaping of language cannot be justified by our experiences.

³ Two other factors contribute to the anxiety: the knowledge of how insecure the former Soviet Union’s chemical and biological weapons are, and difficulties with Saddam Hussein. A third factor could be the

influence of a science fiction novel *The Cobra Event* over President Clinton if a *New York Times* story is right. See William Broad and Judith Miller, "Thwarting Terror: A Special Report; Germ Defense Plan in Peril As Its Flaws are Revealed," *New York Times*, 7 August 1998.

⁴ Jeff Simon's essay *Terrorists and the Potential Use of Biological Weapons* (Santa Monica: RAND Corp, 1989) is still unsurpassed. It is striking that Ron Purver's careful useful discussion of the literature does not contain a single statement by either a potential or actual user. See his "Understanding Past Non-Use of CBW" in Brad Roberts, ed., *Terrorism With Chemical and Biological Weapons; Calibrating Risks and Responses* (Alexandria, VA: Chemical and Biological Arms Control Institute, 1997), 65-74.

⁵ "Messianic Sanctions of Terror," *Comparative Politics* 20, 2 (January 1988): 195-211.

⁶ See William Broad and Judith Miller, "Thwarting Terror: A Special Report; Germ Defense Plan in Peril As Its Flaws are Revealed," *New York Times*, 7 August 1998.

⁷ Cited by Ehud Sprinzak, "The Great Superterrorism Scare," *Foreign Policy* (Fall 1998): 117. Spintzak sent me his essay in proofs just as mine was being finished, and our arguments overlap.

⁸ David Ronfeldt and William Slater's interesting study of the late nineteenth century Anarchist fixation with dynamite certainly runs against the argument that terrorists prefer cheap, safe, easy to transport and assemble weapons. But that fascination did ultimately wear off; and it was initially generated because dynamite was so cheap, not used by criminals, and reliable if one was prepared to give one's own life in the process. The Ronfeldt-Slater argument that this fascination will repeat itself with new technology has not been borne out, and the trend, except in the case of Islam and Sri Lanka, has been to expand the distance between the assailant and weapon to protect the former. See "The Mindsets of High-Technology Terrorists: Future Implications From and Historical Analog," (Santa Monica: RAND Corporation, 1984).

⁹ My "Fear and Trembling: Terrorism in Three Religious Traditions" *American Political Science Review* 78,3 (September 1984): 658-677 attempts to expose the technological determinism myth, by arguing that the modern view of terrorism as a novel recent phenomena, attributable to post-Second World War developments in communications, transportation, and weapon technology is fundamentally flawed. Organized terrorists campaigns go back at least to the first century and contrary to conventional wisdom, earlier organizations were more durable than modern ones, a durability enabling them to wreak more physical and political destruction too. Differences between various historical groups were not due to technologies so much as to differences in doctrine, organizational structure, and intended audiences.

¹⁰ I may have contributed to this misconception when I noted in "Fear and Trembling..." (see note 9) that one could not understand religious terror without remembering that the deity is one of several audiences. This point, alas, was misinterpreted by my good friend Bruce Hoffman in an influential essay to mean that the deity, who never prescribed limits, was the only audience. See his "*Holy Terror*": *The Implications of Terrorism Motivated by a Religious Imperative* (Santa Monica: RAND Corporation, 1993), 7834. See also his *Inside Terrorism* (London: Victor Gollanz, 1998), Chapter 4.

¹¹ American government sources have alleged that the Soviets used chemical and biological weapons against Muslim fundamentalists in Afghanistan. But some reputable sources are unconvinced. See SPIRI Year Book 1985, *World Armaments and Disarmaments* (London: Taylor and Francis, 1985), 5, 169, 173, 180.

¹² See SPIRI, *The Rise of CB Weapons* (New York: Humanities Press, 1971), 121-144. It is often extremely difficult to verify and elaborate allegations concerning the use of chemical and biological weapons for obvious reasons; users with rare exception have tried to hide their tracks and others find political advantage in making and exaggerating allegations. See, for example, the problems associated with Japanese use, Andy Thomas, SPIRI, *Effects of Chemical Warfare: A Selective Review and Bibliography of British State Papers*

(London: Taylor and Francis, 1985), 65-67. We know most about the Iran-Iraq War; and, therefore, when one realizes how little we know about gas there, the result should be humbling. See the careful study by Gordon Burck and Charles Flowerree, *International Handbook on Chemical Weapons Proliferation* (New York: Greenwood Press, 1991), 31-152.

¹³ Efraim Karsh, *Iran-Iraq War; A Military Analysis*, Adelphi Papers, #220 (London: ISSS, 1987), 57. Karsh also says that "Iraq's use of chemical weapons was incremental and heavily circumscribed. Iraq did not employ lethal gas before it had indicated its intentions both by using tear gas first and by continuous and persistent warnings...to leave the door open for an Iranian retreat." An interesting feature of the commentary on the Iran-Iraq War is that the use of chemical weapons received little attention at the time. Shahram Chubin and Charles Tripp's *Iran and Iraq at War* (Boulder: Westview Press, 1988) has six references to it in some 300 pages; altogether the material is less than a paragraph. Most information deals with international reaction. The military significance by the comment "...Iran maintained considerable restraint. It saw no need to imitate Iraq's panicky and cynical use of chemical weapons." 80.

¹⁴ Thomas McNaugher argues that of the 27,000 gassed through 8 April 1987, only 262 died. "Ballistic Missiles and Chemical Weapons: The Legacy of the Iran-Iraq War," *International Security* 15, 2 (Fall 1990): 31; U.S. Department of State James Rubin on 16 March 1998 indicated that 20,000 died but did not explain why the estimate was so different from previous ones. Internet: <http://secretary.state.gov/www/briefings/statements/1998ps980316a.html>. The context, of course, changes when an army strikes a defenseless population. Still, I have not yet found a clear picture of the various impacts of different weapons employed against the Iraqi Kurds in 1987-1988. A Human Rights Watch Report speaks of "tens of thousands dead," but does not estimate the importance of the different weapons. "The Iraqi Government in its Own Words" (February 1994): 13. Earlier analyses indicated that too much time had elapsed to detect chemical traces. Nonetheless, as indicated in the preceding paragraph, a State Department spokesman nearly a decade later felt sufficiently confident to state without explanation that 5,000 were killed by gas in the attack on Halabja.

¹⁵ Reference to chemical and biological statistics vary widely even in well-known documented instances. P. Williams and D. Wallace estimate that in the last six months of the first World War gas accounted for one out of six casualties or between 16% and 17%. See *Unit 731: Japan's Secret Biological Warfare in World War II* (New York: Free Press, 1989), 9. See McNaugher, 19 for statistics regarding the disparity between casualties and deaths from gas as opposed to those from traditional weapons.

¹⁶ Cited by Jessica Stern, "Will Terrorists Turn to Poison" *Orbis* (Summer 1993): 397. Eliot Cohen makes a similar argument in an impressive article on high technology weapons. "Indeed, some high technology weapons probably decrease lethality." See "Distant Battles: Modern War in the Third World." *International Security*, 10, 4 (Spring 1986): 159.

¹⁷ See Burck and Flowerree, 13.

¹⁸ "As the new millennium approaches, we face the very real and increasing prospect that regional aggressors, third-rate armies, terrorist groups and even religious cults will seek disproportionate power by acquiring and using [weapons of mass destruction]." William S. Cohen, "In the Age of Terror Weapons," *Washington Post* 26 November 1997. Jessica Stern drew my attention to the document. The argument reflects, of course, our ever-present assumption that superior technology is decisive in violent confrontations. Jessica Stern discusses Secretary Cohen's statements in *The Ultimate Terrorists* (Cambridge: Harvard University Press, 1999), 7.

¹⁹ We do not know why he was restrained. Nuclear responses were threatened by were they credible in these circumstances? See Keith B. Payne, "Deterring the Use of Weapons of Mass Destruction: Lessons From History," *Comparative Strategy*, 14, 4 (1995) 353-355. If the Allies did intend to use nuclear

weapons, the outrage chemical weapons generated, not their effectiveness, would have made the threat meaningful.

Anticipated terrorist action by Iraqi supported elements against civilians did not materialize either. If either action occurred, the Allies would probably have expanded their military aim to remove the government and/or try Hussein for war crimes. Weapons which enrage but do not create significant military damage are counter-productive, that is to say they do more damage to assailants than to victims.

²⁰ See Eliot Cohen, "Distant Battles.... Libya used gas as a "desperation measure" when its forces were expelled from northern Chad. But most of the gas "missed the Chadian forces and apparently floated over Libyan lines." *Christian Science Monitor*, 5 January 1988. A British assessment of the Japanese use of mustard gas in a 1941 battle against the Chinese who had no protective clothing is worth citing too. "This was a battle in which the Japanese had suffered a reverse – and they used gas to help restore the situation. Remember that the same thing may happen on our front one day when we are pushing them back." Quoted in Thomas, 66.

²¹ "According to a document prepared by a younger brother to Japanese Emperor Hirohito, the Japanese military attempted to poison members of the Lytton Commission, (established) by the League of Nations...to investigate Japan's conquest of Manchuria, by serving them fruit 'laced' with cholera." W. Seth Carus, *Bioterrorism and Biocrimes Working Manuscript* (Washington, DC: National Defense University, December 1998), 82. (Carus' study of non-state groups is the best available.) The Venetian experience usually produced results similar to Japanese.

²² Williams and Wallace, 23

²³ China, on the other hand, reported some 900 incidents on their soil before 1941. It is not clear how the discrepancy could be so great. See Williams and Wallace, 94.

²⁴ Christopher, et. al., "Biological Warfare: An Historical Perspective," *Journal of American Medical Association*, 278, 5 (6 August 1997): 413 and Williams and Wallace, 68-70. The evidence concerning enemy casualties inflicted is very unclear but does not seem to be great. Sheldon Harris' book, *Factories of Death: Japanese Biological Warfare 1932-45 and the American Coverup* (London: Routledge, 1994) indicates that the casualties were higher but acknowledges that little information is available and that problems in the delivery process proved insuperable.

Raymond Zilinskas makes an interesting and persuasive argument that biological toxins have been even less useful to states than chemical ones, but then he goes on to argue that terrorists will find more uses for biological materials than states have. I do not find his reasoning on this point convincing. See his "Terrorism and Biological Weapons: An Inevitable Alliance," *Perspectives in Biology and Medicine* 34,1 (Autumn 1990): 44-71.

²⁵ Parkman is cited in the excellent account of James A. Pourpard, Linda A. Miller, and Lindsay Granshaw, "The Use of Smallpox as a Biological Weapon in the French and Indian War of 1763," *ASM News*, 55,3 (1989): 122-24. The reason for distinguishing between French and Indians is not clear, but the native population was known to be vulnerable. It is commonly believed that the English tried to release a plague against the American forces during the Revolutionary War and the soldiers in the Continental Army were inoculated.

Earlier, the French desperate to stop the Miami Indians from trading with the English in 1732 apparently poisoned some 300. Joseph L. Peysner, "It Was Not Smallpox; The Miami Deaths of 1732," *Indiana Magazine of History* LXXXI (June 1985): 159-169. My thanks to Professor Robert White for sending me the reference.

As in all other cases of chemical or biological attacks, accurate information about spreading smallpox in the native population is difficult to get. Many allegations are made about the French, Spanish, and English practices. See E.W. and A.E. Stearn, *The Effect of Smallpox on the Destiny of the Amerindian* (Boston: Bruce Humphries, 1945). A case of a trader spreading smallpox to avenge an apparent wrong is described by D.R. Hopkins, *Peasants and Princes* (Chicago: University of Chicago Press, 1983), 236.

²⁶ H. Norman Schwartzkopf, *It Doesn't Take A Hero* (New York: Bantam, 1992), 417. General Schwartzkopf is referring to missiles with conventional warheads. Obviously, missiles armed with nuclear weapons are a different matter. But with respect to chemical and biological weapons, the issue is how many of these expensive missiles does one need to create serious damage, and while estimates vary they seem beyond the means of states who are potential adversaries, and certainly beyond the capacities of terrorist groups.

²⁷ Does the “Vietnam Trauma” a prominent feature of the American psyche makes us so casualty averse that the conventional object of battle – break organization – is no longer pertinent? I think that “casualty aversion” becomes a crippling problem only when the war can not be justified and one must depend on conscripts. There was no casualty aversion problem in the Second World War. See my “A Comparative Theory of Military and Political Types,” in Samuel Huntington, *Changing Patterns of Military Politics* (Glencoe: Free Press, 1962) particularly 74-77.

²⁸ Joseph Pilat discusses the CIA report in “World Watch: Striking Back at Urban Terrorism,” *NBC Defense and Technology International*, June 1986, 30.

²⁹ Jessica Stern’s analysis of a RAND database of incidents involving chemical and biological materials from 1968-1987 indicates that 60% served criminal, 21% terrorist, 7% protester, 4% state, 0.5% religious, and 8% unknown ends. See Stern, “Will Terrorists Turn to Poison,” 406.

³⁰ The Germans reported that several thousand died, the Americans said there were no deaths, and the Avengers claimed a thousand deaths. Each party had an interest in giving their own statistics, and as far as I know, there is no definitive account. If the Avenger estimate is correct, the attack is most deadly ever by a non-state group. The Avengers are described by Michael Elkins, *Forged in Fury* (New York: Ballantine Books, 1971) and Michael Bar Zohar, *The Avengers* (New York: Hawthorne Books, 1967). The war trials did not occur because of the Avengers; still, once the trials were announced, the basic rationale for the group disappeared. Carus notes that there is not enough information available to establish the true casualty statistics, and Ehud Sprinzak tells me that the American claim that no deaths occurred seems accurate.

³¹ Information concerning the Paris incident comes from a variety of sources, government officials, newspapers and books. But the details are not always identical and cannot be verified from open sources. See Carus, *Bioterrorism and Biocrimes*, 72. Carus also indicates that information concerning other incidents specified in this paragraph is too meager to analyze.

³² Presently, we have no analysis of chemical attacks outside the United States. Carus, *Bioterrorism and Biocrimes* examines all biological attacks by individuals and non state groups. A CNS Monterey Institute of International Studies study, *Terrorism in the U.S.A. Involving Weapons of Mass Destruction* (Monterey, 1988) looks at chemical and biological efforts in the United States. Both studies are good and demonstrate how difficult it is to be definitive about many cases.

³³ Jack Anderson, “Chemical Arms in Terrorism Feared by the CIA” *Washington Post*, 27 August 1984. B. David, ‘The Capability and Motivation of Terrorist Organizations to Use Mass Destruction Weapons,’ in Ariel Merari, ed., *On Terrorism and Combating Terrorism*, (Frederick, MD: University Press of America,

1985), 150-151. Not much time has elapsed since the 20 March 1995 incident, and so perhaps the thesis has not yet been truly tested.

³⁴ Murray Sayle, "Nerve Gas and Four Noble Truths," *New Yorker*, 1 April 1996, 71.

³⁵ Most U.S. analysts initially thought that *Aum* either used a poor quality sarin or had not developed a proper distribution system. For reasons related, I think, to our misunderstanding of religious terror, we found it difficult to believe that *Aum* members were concerned with their own lives.

Early newspaper reports exaggerated *Aum* accomplishments and the most misleading was the claim that *Aum* had developed biological weapons. That claim and others repeated in David Kaplan and Andrew Marshall's *The Cult at the End of the World*, (New York: Crown Press, 1996). See Milton Leitenberg, *Biological Weapons Arm Control*, PRAC Paper #16, College Park, CISS, School of Public Affairs, University of Maryland, May 1996. See also a second Leitenberg piece "The Widespread Distortions of Information on the Efforts to Produce Biological Warfare Agents by the Japanese *Aum Shinrikyo* Group: A Case Study in the Serial Propagation of Misinformation," forthcoming in *Journal of Terrorism and Political Violence* (Winter 1999).

³⁶ The 56% estimate is based on data collected by Robert and Terry Falkenberg White and covers a five year period. "Revolution in the City: On the Resources of Urban Guerrillas," *Terrorism and Political Violence* 3,4 (Winter 1991) 100-132. Some accidents, of course, may be due to British intrigues. But J. Bowyer Bell, a very reliable, long time student of IRA tactics notes, "Other than carelessness that comes from familiarity and limited original training, the necessity for speed and the quality of the weapons are major reasons for premature explosions." *The Gun in Politics* (New Brunswick: Transaction, 1987), 51.

³⁷ How typical is the IRA experience with respect to "accidents?" We have no data to compare groups systematically. Still anyone familiar with the history of modern terrorism since the beginning in the nineteenth century will agree that the experience seems to be common.

³⁸ "The great killer in all of the wars under discussion has been (a product of) the simplest technology, the artillery round, which is not greatly different from its ancestor in World War I (with the possible exception of cluster bomb units, which however do not differ greatly in *conception* from the shrapnel shell at the beginning of the war). The high technology Exocet missile, for example, caused only a handful of casualties in the Persian Gulf War..." Cohen, "Distant Battles." 158-59, original emphasis.

The comment of a prominent anthropologist is worth citing in this connection. "Citizens of modern states tend to believe that everything they do is more efficient or effective than the corresponding efforts of primitives or ancients...Therefore, it comes as a shock to discover that the proportion of war casualties in primitive societies almost always exceeds that suffered by even the most bellicose or war-torn modern states." L. Keeley, *War Before Civilization* (New York: Oxford University Press, 1996), 88.

³⁹ On the other hand, the Armenian reaction was different. Armenian groups initially tried to kill Turkish officials they thought responsible; and when the latter died any Turkish official might be fair game.

⁴⁰ For a good discussion of *Aum*'s theology, see Manabu Watanabe, "Religion and Violence in Japan Today; A Chronological and Doctrinal Analysis of *Aum Shinrikyo*" *Terrorism and Political Violence*, 10.4 (Winter 1998): 80-100. Watanabe does not consider a possible Thug connection.

⁴¹ See Carus, *Bioterrorism and Biocrimes and Terrorism in the U.S.A.*

⁴² Martha Crenshaw's perspective, "Incentives and Disincentives for Nuclear Terrorism" contains an interesting discussion of what we do not know about these matters, (APSA unpublished paper, 1997).

⁴³ See C.J.M. Drake “The Role of Ideology in Terrorists’ Target Selection,” *Terrorism and Political Violence*, 10,2 (Summer 1998): 53-85.

⁴⁴ See Anderson, “Chemical Arms....” and Richard Danzig, “The Next SuperWeapon: Panic,” *New York Times*, 15 November 1998. Danzig says of biological weapons, “Neither their production nor their delivery requires large, expensive, or visible systems. Potent biological weapons can be made in a room and held in a vat.”

⁴⁵ The figures are compiled from the materials in the Monterey Institute Report, *Terrorism in the U.S.A. Involving Weapons of Mass Destruction*.

⁴⁶ See Carus, 12 and 26. Diseases like the Black Plague which afflicted medieval Europe or the influenza epidemic in the early twentieth century killed more than weapons in the period did. But, fortunately, we don’t know how to create epidemics we can control.

⁴⁷ See Taiji Myaoka, “Terrorist Crisis Management in Japan; Historical Development and Changing Responses; 1970-97,” *Terrorism and Political Violence*, 10,2 (Summer 1998): 31.