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CHEMICAL AND BIOLOGICAL TERRORISM: PROFILE OF AN INTENSIFYING NON-CONVENTIONAL THREAT

*Dany Shoham*¹

Basic Characteristics

Chemical and biological (C/B) terrorism implies sabotage or guerrilla warfare conducted by means of poisonous substances or microorganisms, which can damage humans, livestock, crops or useful materials, such as fuels. C/B terrorism includes the categories of enviro-terrorism (the environment – air, water – being the vehicle for C/B agents), direct personal terrorism (using C/B agents to assassinate selected or random individuals), narco-terrorism (drugs infiltration into target populations) and non-lethal warfare (the latter recently developed for C/B sabotage mainly aimed at logistic infrastructures¹). The effect of C/B terrorism may be tactical or strategic; acute or continual; physical and/or mental. Thus, C/B terrorism is sometimes regarded as employment of weapons of mass impact, (both psychological and physical), rather than mass destruction. C/B terrorism is not a new threat, but is an increasingly worrisome one.

Terrorists would have to be motivated to conduct C/B terrorism, but would not need to produce such weapons themselves. Many industrial or laboratory toxic materials as well as disease-causing bacteria can readily be obtained in quantity at once or gradually through purchase or theft. Hence, technically, the determinative factor would be the efficiency of disseminating C/B agents. According to Stock,² there are certain putative advantages of chemical and biological agents for terrorists:

- Their horrible effects would tend to heighten terror and cause panic;
- Their undetectability by traditional anti-terrorist sensor systems;
- The difficulty of defending against C/B agents;
- Compared to conventional arms, the ease with which they can be disguised, transported, and introduced into a target area;
- Their usefulness for individual assassination;
- A possible time lag between release of the agent and its perceived effects;

¹ **Dany Shoham** is a senior researcher at the Begin-Sadat (BESA) Center for Strategic Studies, Bar-Ilan University, Israel. He investigates chemical and biological warfare in Arab countries, in Iran and around the world. Formerly, he was a senior analyst and lieutenant colonel in military intelligence. **Dr. Shoham** received a Ph.D. in medical microbiology from Tel Aviv University. He has published numerous articles on virology and on chemical and biological weapons. He is a frequent contributor to the ACPR Policy Paper series as well as *Nativ* on these topics.

- The possibility for anonymous attacks;
- Some agents are temporarily incapacitating, rather than lethal;
- The technical equipment for preparation on a small scale is easily purchased;
- The technologies to produce chemical and biological agents are well described in the open literature;
- The delivery of toxic or infective agents may be carried out by highly effective routes such as municipal water systems or the air.

Generally speaking, the threat of C/B terrorism poses at present a menace that practically and expediently ought to be dealt with. The probability of this menace to materialize wildly is now higher than ever before in relative terms, is fairly obvious in absolute terms, and is currently intensifying.

The Japanese Incidents

Japan experienced the most dangerous action of chemical terrorism yet recorded. In March 1995, a local fanatical Buddhist cult named Aum Shinrikyo – Supreme Truth – employed the nerve agent sarin in the Tokyo subway, killing 12 people, injuring 5500, of whom about 700 were hospitalized, and inducing tremendous panic. By March 1997 about 20% of those hospitalized were still afflicted by various disorders.³

Sarin was chosen for this action in light of its relatively easy manufacture, marked lethality, high volatility and availability of its precursors.⁴ It was calculated to kill many government bureaucrats on their way to work, yet the self-produced toxicant was of low grade, further diluted with an organic solvent so as to reduce the risk taken by the unprotected saboteurs,⁵ and poorly disseminated.

Dispersion of the toxicant was passive, resulting from the puncturing of sarin-containing plastic pouches with sharpened umbrella tips.⁶ The pouches were made of three-ply nylon polyethylene that had been sealed with a special laminating machine.⁷ Beyond this incident in itself, some features of the fanatic sect which conducted it are of particular significance. Being a non-state-sponsored terrorist organization, it was not traced by intelligence monitoring, as admitted by the heads of the US intelligence community.⁸ This terrorist organization directed extensive systematic acquisition of materials over 100 tons and equipment for the production of both chemical and biological weapons, through a network of front companies and agents overseas.⁹

Concealed, yet fairly sophisticated facilities belonging to the sect were used for development and production of C/B warfare agents and modes of delivery. The agents included sarin, VX, cyanide, anthrax and botulinum.¹⁰ Q fever has reportedly been researched into as well.¹¹ An apparent disguised attempt to obtain the deadly exotic Ebola virus has been conducted in Zaire.¹² Also, it seems that the cult was trying to engineer deadly new bacteria.¹³ A Russian military helicopter plus two drone aircraft intended to be equipped with sprayers for disseminating C/B agents over major Japanese cities were acquired as well.¹⁴ Besides, a truck equipped with a nozzle device was employed in practice by the sect for spraying a cloud of vaporized sarin in a town in central Japan in June 1994, causing the death of 7 people and injury of over 260.¹⁵ Syringes containing self-produced VX had been successfully employed by the sect to assassinate its critics in Japan during the period December 1994 – January 1995. Finally, in May 1995,¹⁶ in another subway in Japan, the cult operated a self-developed primitive device designed to produce and disperse hydrogen cyanide, which fortunately failed upon activation. The fact that such events, in such sequence, could have taken place repeatedly in so disciplined and well developed a state as Japan, is indicative of the extreme nature of C/B terrorism.

The Continuing Course of C\B Terrorism

Japan's dramatic experience is merely the high point so far in the history of C/B terrorism. As early as 1971, a handbook for left-wing terrorists entitled "The Anarchist's Cookbook" was published.¹⁷ Lately, two other

mail-order primers have been found in the possession of right-wing groups: "The Poisoner's Handbook" describes how to produce poisons including the extremely potent plant toxin ricin in a home laboratory, while most effective modes for delivering such poisons are described in "Silent Death".¹⁸ Also, detailed instructions on how to produce C\B weapons for terrorist purposes have been distributed during recent years by groups affiliated with the extreme left and right of the political spectrum.¹⁹

Nonetheless, C\B terrorism surfaced, indeed, in the 1960s, and there have been a series of events ever since, as shown by the long list of recorded incidents presented at the end of this article.

By now, the menace posed by C/B terrorism is seriously acknowledged and gravely ranked. Thus, the Pentagon has been advised by a Congress-nominated professional team to face unquestionably that menace during the next decade as first priority,²⁰ and the US Senate Permanent Select Committee on Intelligence positively recommended that an annual National Intelligence Estimate on the likelihood of terrorist CBW and nuclear attacks in North America be prepared.²¹

Techniques, Trends and Attitudes

There is a wide variety of ways to employ C\B agents for terrorism purposes. In general, the C/B agents would get into the body through contaminated air, food, water or drinks, or via skin. For example, terrorists might use for generating air contamination a commercially available agricultural sprayer, fogger or duster mounted on a microlight plane, small unmanned airplane, helicopter, boat, sealed vehicle, or carried by a saboteur. Aerosol canisters activated by a timing mechanism so as to disperse C/B agents in crowded sites may be used as well. Other techniques could include blowing up installations where toxic materials or dangerous microorganisms are held; gradual or massive placing of harmful or toxic C/B contaminants into any publicly consumable system. The perpetrators might not be traceable. Threats, even if not fulfilled, could be used for blackmail or to cause panic and demoralization. Economic bio-terrorism could target livestock or crops.²²

The well-known Russian scientist Vil Mirzayanov described tests of a new agent called "FT" to poison town water supplies in Afghanistan.²³ The Tokyo subway sabotage event was based on a nerve agent developed for military purposes, but terrorists could use simpler compounds such as phosgene or cyanic acid, and, of course, quite effectively, pesticides or drugs. Radioactive substances are included as well.

Political instability coupled with the failure of terrorists to achieve their aims and the emergence of new types of extremist groups can lead to escalating violence.²⁴ Terrorists seem increasingly to prefer indiscriminate types of attacks, as shown by a growing use of car and suicide bombings in public places.²⁵ Each such attack – and the events in Japan – can encourage others to copy the techniques or raise the stakes.²⁶ Such weapons can also be attractive as security is tightened and groups try to shock societies and media already immunized to high levels of violence.²⁷

Apocalyptic terrorists are the chief ones likely to use C/B terrorism, however, since more conventional terrorists would be more likely to recognize the high political risks of making C/B threats.²⁸ Still, terrorist use of state-supplied C/B weapons is fairly feasible as providing a state with a cheap way to test the effectiveness and dispersal techniques of such products and circumvent the strategic and political limitations of conventional warfare. Thus, the supply of such weapons from state-run arsenals to terrorist organizations cannot be wholly ruled out.²⁹

The implication of these assessments is that governments should be prepared for a variety of C\B attacks including morale-damaging threats or small-scale actions.³⁰ A particularly grave problem would occur if a C/B sabotage action were untraceable, not even knowing whether it had been done by a state, a group or an individual. Moreover, the release of deadly agents into the atmosphere may cause a crisis for both federal and local governments;³¹ particularly if the saboteurs are not traceable, and there is not even a chance to comprehend whether the sabotage has been conducted by a state, an organization or an individual. Also,

objective difficulties may hinder intelligence monitoring of preparatory steps taken towards C/B terrorism acts.

The sharply escalating threat of C/B terrorism has been clearly acknowledged by top intelligence officials in various countries. A 1992 German Intelligence report stated that terrorist groups are making tremendous efforts to acquire C/B weapons and that by threatening large cities the terrorists might gain concessions for almost any demands they make.³² The former director of the US Defense Intelligence Agency called the potential for terrorism involving C/B weapons one of the “most nightmarish concerns”.³³ Former CIA director, James Woolsey, speaking at the 28 April 1997 Sam Nunn Policy Forum “Weapons of Mass Destruction and US Security,” in Athens, GA, warned that if a major unconventional terrorist attack were carried out in the US, it would come as a big shock. Woolsey suggested a CW attack could result in 50,000 fatalities, a BW attack 500,000. He cautioned that the possibility of a false flag operation – for instance, Iraq using Iran or vice versa – could be a factor that might make it difficult to determine who was behind the attack and undermine prospects of retaliation, and therefore, deterrence. Fred Ikle, Under Secretary of Defense in the Reagan administration, wrote in *The National Interest*, Spring 1997, “A century and a half into the Industrial Revolution, advances in science and technology have reached the stage where leading industrial nations can make weapons of mass destruction that are so lethal relative to their size and weight that they can be used to circumvent defenses – even in clandestine ways – for the purpose of annihilating a country’s society without first defeating its military forces. ...The morning after a major biological or chemical [terrorist] attack, or after a nuclear weapon has been used, the rules of warfare throughout the world will be profoundly transformed. Should such use go unpunished, or worse, should it benefit the perpetrator, tyrants, everywhere would be greatly tempted to acquire and eventually to employ these weapons.”

The CIA’s director recently stated that terrorist groups are increasingly exploring the feasibility and effectiveness of C/B sabotage and that C/B terrorism is the most urgent challenge to be coped with, including possible assassination of the president by C/B terrorism. The cardinal question of “would” a major act of C/B terrorism take place turned into “when would” it happen, he added.³⁴

Subsequently, President Clinton transmitted to the Congress a report describing the system formed to counteract the threats of terrorist use of weapons of mass destruction.³⁵ A comprehensive study calibrating risks of and responses to C/B terrorism has recently been conducted by the American (Virginia-based) C/B Arms Control Institute.³⁶ In Russia, the menace posed by C/B terrorism has lately been addressed as well.³⁷

Yet, beyond all of those concerns, there exists the remarkable example of the South African Apartheid regime’s extensive program of C/B terrorism against the black population of its own country. Lately revealed, this program included a diversity of extreme and outstanding C/B means, intended to generate various damaging effects, some of which are almost unimaginable.³⁸

Bio-Terrorism – Expected to be the Preferred Mode of Action

In terms of a pragmatic clinical feasibility study, bio-terrorism is, at least potentially, the most efficient form of sabotage, particularly when conducted indistinguishably from a natural event. Moreover, it may have a fully strategic impact; hence, it is often reckoned to be the ultimate mode of terrorism. Under optimal meteorological conditions, producing 50% fatalities over a one-square-mile area would require about a metric ton of chemical nerve agent but only about 10 grams of anthrax spores.³⁹ Additional data shows the impact of anthrax in terms of some 20,000 to 80,000 casualties afflicted by 30 kg of this biological agent, as compared to 400 to 6000 casualties afflicted by 300 kg of sarin nerve gas, and 80,000 casualties afflicted by 20 kiloton of a nuclear weapon.⁴⁰ Moreover, official US estimates for casualties produced by an airplane, flying upwind of a city, releasing successfully a cloud of anthrax germs, range from 100,000 to three million dead. An individual driving a car around a medium-sized city spewing anthrax out the tailpipe would cause some 70,000 fatalities, two individuals in two cars in two cities, 140,000 (referring to unprotected population). These are, of course, theoretical estimates, yet they illustrate the proportional impact of a biological agent, (in this case anthrax) – a non-contagious one. Notably, most biological agents are not

contagious, yet they might generate extensive outbreaks – if not epidemics – due to their transmissibility in other ways; thus, it is also possible to disseminate infected insects or infected animals, (like rats, for instance). Also, deliberate infection of contacts by an infected individual harboring a contagious disease (Aids, for example – a plot already carried out not infrequently), is, in a sense, an act of bio-terrorism.

A terrorist group intending to employ biological agents will likely be attracted to their mass killing potential.⁴¹ In addition, their delayed impact may also enable the saboteur to escape detection. Also, an attacker might reckon the resemblance between a natural and an unnatural epidemic to be close enough to divert suspicion, or at least make it extremely difficult to trace.⁴² That would make it difficult to retaliate with a massive punitive strike, expectation of which ordinarily serves as deterrent to an unconventional assault. Thus, the subsequent chaos resulting from the inherently unknowable may make biological agents the terrorist weapon of choice.⁴³

It is further assessed that terrorists are certain to acquire and operate biological weaponry,⁴⁴ deciding for themselves whether the use of them serves their cause.⁴⁵ Moreover, it is believed that biological weapons are preferable to chemical weapons in the near future for terrorist groups, and that the allure for terrorists of biological weapons is currently intensifying due to the increase in availability of biotechnologists and sophistication of manufacturing methods.⁴⁶ Plausibly, state-supported terrorist groups would be the most likely of all terrorist groups to get hold of biological weapons, by the supporting government transferring entire systems from their national programs.⁴⁷

Thus, the US security system is concerned about a combination of conventional and bio-terrorism.⁴⁸ The remarkable psychological responses subsequent to a biological terrorist attack were summarized as follows: horror, wrath, panic, paranoia, demoralization, magical thinking about germs and viruses, fear of invisible pathogenic agents, fright of contagion, anger at terrorists, government, or both, attribution of arousal symptoms to infection, scapegoating, social isolation, loss of faith in social institutions.⁴⁹

Water and ventilation systems may be targets. According to Norqvist, terrorists might effectively and easily disseminate biological agents through water systems, resulting in a high number of casualties, the terrorism focusing either on large cities or military facilities. It is pointed out that chlorination can be neutralized by using naturally chlorine-resistant microorganisms or constructing bacteria resistant to chlorine concentrations normally used in the municipal drinking water systems.⁵⁰

Simple devices might be used to deliver biological agents into the ventilation systems of buildings. The vulnerability of the New York Stock Exchange to such an attack was recently determined and has since been corrected. Open-air experiments carried out in the 1960s demonstrated that throwing a light bulb filled with biological agent before an incoming subway train during rush hour is sufficient to infect tens of thousands of people.⁵¹ Further distribution might well be attained by the release of insects infected with pathogenic bacteria or viruses.

Indeed, there are some significant objective difficulties in conducting bio-terrorism, though those can readily be overcome in cases of state-sponsored bio-terrorism, or at least given professional assistance from microbiologists⁵² (for instance, the extremely worrisome pull of unemployed or underpaid formerly Soviet biological weapons scientists). Thus, Col. David Franz, deputy Commander of the US Army's Medical Research and Materiel Command, told the Senate lately that BW terrorism is difficult to carry out. Col. Franz explained that for such an attack to be effective, it would require a "large well-funded terrorist program or state sponsorship", whereas Sen. Richard Shelby, Chairman of the Senate Intelligence Committee said, "For Saddam Hussein, biological agents may be the perfect terrorist weapon, because they require more time to take effect and could leave minimal telltale evidence implicating Iraq." Hence, there is far from a consensus on that score. Many, including the FBI, seem to believe that BW terrorism does not require much expertise. An FBI spokesman said that "With a little bit of knowledge and a little bit of depravity, you have the makings of a horrendous event."⁵³ Also, the FBI might fall for a false-flag operation. A terrorist state might use American extremists, for example, to carry out such an attack. The FBI might catch the extremists, but not understand they were minor figures, and present them instead as major figures.

All in all, the practicability of biological terrorism is fairly plain, though a degree of professional knowledge is needed for planning and preparations.

The Middle East

Egypt was the first Arab state to employ chemical weapons – during its intervention in Yemen’s civil war in the 1960s – and was also the first Arab country to use a deadly toxin for personal assassination; the victim was the Egyptian Chief of Staff, Field-Marshal Amer (after the Egyptian army had been defeated in 1967 by the IDF), and the killing agent was, reportedly, the powerful plant toxin aconitine.⁵⁴ Some 10 years later, Egyptian secret agents allegedly used poison-filled syringes for assassination in Europe.⁵⁵

The Iraqis choose another horrifying toxicant for conducting a continuing series of political assassinations – thallium – an extremely poisonous metal, mixed by Iraqi agents with food or drink served to the selected victims. Indeed, the dying of thallium intoxication is very slow and dreadful. A nerve agent has also been effectively used by the Iraqis in a clandestine poisoning of food and pathogenic microorganisms, reportedly, in fostering outbreaks of typhoid and malaria within Kurdish populations. Iraqi agents were trained in employing chemical and biological warfare agents against civilian targets at a special school near East Berlin and at training camps in the Middle East.⁵⁶

In 1980, a stock of cyanide poison was allegedly discovered by Iraq during searches of the Syrian Embassy in Baghdad.⁵⁷ Also, the Syrian regime apparently used cyanide during the massacres of Syrian civilians at Hama in 1982, thus killing some 18,000 people.⁵⁸ Syrian involvement in the massive production and smuggling of hashish and heroin from Lebanon can be considered as a form of terrorism (narco-terrorism) aimed at undermining the morale and social strength of Israel and the West, as well as a major money-making device. Cocaine is likewise produced and distributed, and it has been assessed by the Israeli deputy coordinator of activities in Southern Lebanon that Israel is actually but a marginal objective in the global narco-terrorism strategy of the Hizbullah.⁵⁹ Iran, through the Hizbullah, is evidently involved as well.⁶⁰ Besides, Israeli sources were said to believe that Hizbullah acquired CW from Iran.⁶¹

Nevertheless, the Israeli Defense Forces have reportedly been responsible, until the late 1980s, for continuing supplying of large amounts of hashish from Lebanon to the Egyptian army, so as to weaken its soldiers.⁶²

Libya, in light of its extreme nature, avidity for terrorism, and C/B cooperation with Iran, Iraq and Syria altogether, might also be involved with anticipated C\B terrorism. In a single known case, in 1978, Libya sent a poison gas letter to a PLO official visiting Tripoli. It is generally believed, however, that the main danger from radical regimes in terms of C\B weapons is they might give them to terrorist groups.⁶³ Thus, an ostensibly less important state like Sudan maintains on its own territory (near the Islamic Center in Suba, South-West of Khartoum) a unique center for the development of chemical weapons for the use of Muslim terrorists.⁶⁴

A number of cases in which contamination was intended or carried out, mostly by Arab terrorists against Israel, are mentioned in the chronological list, below.

Since the 1970s, Palestinian elements alongside with Red Army Faction and Red Brigades put considerable effort into trying to recruit microbiologists, purchase bacteriological experimentation equipment, and dabble in sending deadly agents like anthrax germs through the post to potential victims.⁶⁵ In 1971, the Bavarian State interior ministry reportedly referred to “rumors concerning Palestinian plans for using nerve-gas spray cans in future aircraft hijacking attempts.”⁶⁶ Various preparations related to C/B terrorism reportedly included Arab terrorists attempting to acquire nerve gas and bacteriological agents,⁶⁷ Baader-Meinhoff members training in a Palestinian terrorists’ camp in Lebanon in using bacteriological weapons,⁶⁸ as well as Palestinian terrorists being trained in chemical and biological warfare in the USSR,⁶⁹ and in guerrilla CB weapons applications in East Germany, during the 1980s.⁷⁰ Documents said to have been captured from the PLO in Lebanon in 1983 indicated that PLO personnel had received Soviet training in the use of CW.⁷¹

The commander of the PLO's Force 17, Colonel Abu al-Tayyib [Mahmud al-Natur] revealed that his force had acquired CW which could be used against Israel. Many Palestinian experts have been trained in the use of these kinds of weapons in friendly countries, he told the Arabic newspaper Al-Nasr, and added that "The CW are necessary for the war we are waging and we won't hesitate to use them in future battles in the appropriate way and time against military installations of our enemy in the occupied territories."⁷² Diverse capabilities of Palestinian terrorist organizations to employ CB agents have been described.⁷³ Yet, even without external assistance, the technical infrastructure, which is seemingly minor, presently evolving within the Palestinian-ruled areas may support, today or in the near future, C/B terrorism.

The potential threat of CB weapons use by Middle East Moslem terrorist groups, has been indicated by the current head of the CIA.⁷⁴ James Woolsey, former head of the CIA, recently noted, "Hizbullah are most likely suitable to conduct biological terrorism, which is an easy way to kill many people".⁷⁵ Recently, a major concern that terrorist organizations, perhaps equipped by Iran or Syria, would use C/B weapons against Israel, has been expressed by very senior Israeli officials. An unequivocal message has reportedly been delivered by Israel that a strong response against sponsoring states would be made.⁷⁶ However, identifying a sponsoring state could be difficult.

Iran, indeed, developed specific means for biological terrorism, mainly devices for aerosol dispersion and water systems contamination, and intends to employ those devices through its secret agents in the West.⁷⁷ (Moreover, Israeli analysts assess that Saddam Hussein is precisely the person to pull off biological terrorism, in the form of a saboteur dropping pellets of a biological warfare agent in the water supply or release it in the air in Tel Aviv or Jerusalem, bringing about the death of hundreds, maybe thousands.⁷⁸) Further, it has been added elsewhere that if Saddam intends to attack Israel with BW agents, would it not be more likely to do so through terrorist means which are deniable and offer a technologically easier and more effective way to disperse such agents, rather than through ballistic missiles?⁷⁹

In summary, a grave threat of C/B terrorism does exist, particularly in the Middle East, or otherwise is induced by Middle-Eastern Moslem countries. Technically, the resources needed for working out and accomplishing C\B terrorism are definitely available in the Middle East, particularly in countries such as Iraq, Libya and Iran. Directing world wide terror systems, those countries may probably assimilate the dimension of C/B terrorism into those systems locally, in the Middle East, as well as globally.

Paramount attention should be paid to the possibility that terrorists would attempt to follow the relative operational success of the chemical terrorism attacks in Japan. Such an attack would be easy to carry out, in technical terms. The cardinal problem in this concern is seemingly the operational easiness typifying such terrorist actions, and, consequently, their actual feasibility.

Once a single incident takes place, it might generate – especially if deemed successful or the perpetrators remain anonymous and unpunished – an escalating chain reaction of C/B weapons employment.



Chronology of Middle East C/B Terrorism-Related Events: 1978-1998

[See also Middle East section, above, for additional incidents.]

1978 – Exported Israeli oranges were mercury poisoned by Palestinian terrorists in cooperation with Iraq, stating that their goal was to sabotage the Israeli economy rather than killing European consumers. Poisoned oranges were found in Great Britain and West Germany, as well as in the Netherlands, where some children were killed. The following year, the same terrorist group threatened to poison Israeli agricultural exports to Europe.⁸⁰

1982 – US Member of Congress claimed that “the Israelis also captured PLO representative chemical weapons in Lebanon.”⁸¹

1983 – Israeli Arabs intended to contaminate water sources in the Galilee by poisonous powder.⁸²

1985 – Coffee was contaminated in an Israeli military dining room by carbamate pesticide.⁸³

1991 – In Haifa market, Gerber baby food was contaminated by methomyl pesticide.⁸⁴

Drugs consumed by Jewish citizens of Jaffa were contaminated by rodent poison.⁸⁵

Thirty-five kilograms of extremely poisonous pesticides were stolen from the experimental farm of the Faculty of Agriculture in Rehovot.⁸⁶

1992 – In a mini-market in Jerusalem, a Palestinian worker contaminated various food articles by parathion.⁸⁷

1993 – Cucumbers were contaminated by parathion in Kibbutz Karmia in the Negev.⁸⁸

1994 – Contamination (unconfirmed as deliberate) of the Yarkon River, which caused fish mortality.⁸⁹

Contamination (unconfirmed as deliberate one) of bottled drinks in a factory near Tel Aviv.⁹⁰

1995 – Water consumed by turkeys was contaminated in the agricultural settlement of Shalva.⁹¹

1996 – Deliberate influx of sewage from Judea and Samaria into Israel is currently being conducted, according to the Israel Minister for Environment Quality, by the Palestinian Authority, causing the contamination of the Israeli water system.⁹² It should be mentioned that in the past, outbreaks of cholera occurred in the territories as a result of sewage being routinely used for the irrigation of vegetables. Also, the factual situation is that most of the streams found in Israel stem from the mountainous aquifers which are mostly located in the Judean and Samaritan Hills, parts of which have already transferred over to the Palestinian Authority and which are now outside of Israeli territorial control. The other sources stem from Ramat HaGolan, (which is currently on the negotiating table) and Southern Lebanon. The implications of this situation are that if Israel should return to its 1967 borders, the Jewish State would lose 75% of the territorial control over its waters.. Thus, for instance, the import of vegetables into Israel from the territories has been officially forbidden because of concomitant extreme bacterial contamination,⁹³ which, not surprisingly happened to be the result of systemic, apparently innocent, irrigation by sewage; also, the Hadera stream has been severely contaminated by sewage.⁹⁴ Parallel, in a sense, is the possibility that the sporadic infiltration of rabies infected animals into Israel from the territories, as well as from Syria and Lebanon, resulting from innocent carelessness,⁹⁵ would evolve into an intentional and systemic one.

1997 – An Israeli citizen acting on his own for the purpose of blackmailing, threatened two Israeli leading food manufacturers with bacterial contamination of their products.⁹⁶

Israelis affiliated with an extreme non-political organization sprayed harmful chemicals on Palestinian-owned vineyards.⁹⁷

In Amman, a leader of the Hamas organization was poisoned by an agent of the Mossad, possibly using a fentanil derived toxic compound. The victim's life was saved by an antidote supplied by Israel. This attempt to assassinate by means of a poison has been regarded by a senior ex-Mossad official as an event that opens a very dangerous gate in front of the enemy and gives him the power to employ such weapons in various forms against objects he would choose, in places convenient for his saboteurs. The event immediately stimulates, in addition, foreign elements, particularly German, to encourage terrorists to use such weapons.⁹⁸

In Ramallah, an anesthetic substance has been caught in the hands of Palestinian terrorists affiliated with the Hamas.⁹⁹

1998 – The Hizbullah obtained C/B weapons with the assistance of two businessmen situated in Switzerland.¹⁰⁰

Several Muslim terrorists affiliated with the Algerian “Armed Muslim Group” were arrested in Belgium, holding a lot of information about C/B weapons and about the World Cup football games.¹⁰¹

A leader of the “Islamic Jihad Movement” stated that the Islamic movements have eventually found the secret for defeating their enemies – and that is the weapons of mass destruction, which can very simply be obtained.¹⁰²

Chronology of Global C/B Terrorism-Related Events: 1964-1998

1964 – Cuba accused the USA of causing a major reduction in Cuban sugar cane crops by means of a biological warfare agent. Later, American authorities admitted the existence of an American program of covert biological warfare against the Cuban economy.¹⁰³

1965 – In Japan, outbreaks of typhoid and dysentery were intentionally induced by a local bacteriologist.¹⁰⁴

1967 – In the USA, cyanide was found to be held by the Revolutionary Action Movement.¹⁰⁵

1970 – In Canada, several students became badly ill after eating food intentionally contaminated with the eggs of a parasitic ringworm.¹⁰⁶

1972 – Two men affiliated with the US group “Order of the Rising Sun”, who eventually fled to Cuba, had conspired to contaminate the water supplies of some large Midwestern cities with stocks of Typhoid fever germs cultivated by one of them. Up to 40 kilograms of bacteria cultures were found in a college laboratory.¹⁰⁷

1974 – In the USA, a nerve agent was found on a potential assassin who was planning to kill the president in Washington.¹⁰⁸

1976 – A nerve agent (sarin) was brought into the United States by Michael Townley for use in an assassination plot against former Chilean Foreign Minister Orlando Letelier. The agent had originally been produced by Chile for possible use against Argentina or Peru, and was smuggled into the US in a Chanel No. 5 atomizer. Subsequent reports surfaced that anti-Castro Cubans in the United States had learned of the Chilean-produced sarin and had asked DINA, the Chilean intelligence organization, for some in connection with their activities.¹⁰⁹

One kilogram of a precursor of sarin was produced by a chemical engineer in Vienna and offered to bank robbers for 14,000 DM.¹¹⁰

The Baader-Meinhoff gang threatened to poison water in 20 West German towns if three radical lawyers were not allowed to defend a comrade who was on trial.¹¹¹

A California man was arrested for threatening to set off a “toxic bomb” unless he received \$1 million ransom payment.¹¹²

1978 – A threat was made to contaminate the water supply of Phoenix, Arizona, if extortion payments were not made.¹¹³

A Bulgarian defector was assassinated on a London street by a Bulgarian agent, using an umbrella weapon that fired a microscopic device containing the deadly toxin ricin into the victim's leg.¹¹⁴ A repeated attempt to assassinate another Bulgarian defector had been conducted one month later in Paris. The device, developed by the KGB, was a metallic pellet, 1.7 mm in diameter, cross drilled, filled with ricin and sealed with wax intended to melt at body temperature. Similar devices have possibly been employed in at least 5 other assassination cases.¹¹⁵

Huk guerrillas poisoned pineapples due for export from the Philippines.¹¹⁶

Four hundred kilograms of intermediate compounds that could be used for organophosphorus nerve agents were discovered in a terrorist safe house in West Germany.¹¹⁷

1979 – Attempted Soviet assassination of Afghanistan President Amin by a cook, who poisoned his food.¹¹⁸

1980 – Assassination of CIA agent Boris Korczak in McLean, Virginia, Tyson's Corner, using a ricin weapon, possibly in umbrella configuration.¹¹⁹

Several embassies in Europe received threats of terrorist use of a mustard agent against them.¹²⁰

Police raided a German Red Army Faction apartment in Paris and found a miniature laboratory containing a culture medium of the germ which produces the super-toxic Botulinum toxin. Notes about bacteria-induced diseases were found in the apartment as well.¹²¹

1981 – A Towson State University professor, convicted of shoplifting, attempted to kidnap the store manager in an act of revenge. After a struggle, the professor was arrested. In his car, the police discovered a propane cylinder with a gear-driven motor battery powered to open the valve controlled by a clock timer delay. The cylinder contained hydrogen cyanide gas.¹²²

Herbicide contamination of food items in British grocery stores is discovered.¹²³

Protesters claimed to have taken infected soil from the Hebridean island of Gruinard and placed it at the chemical defense establishment at Porton Down. The island has been closed to the public since germ warfare experiments on sheep were conducted there in 1941. The anthrax spores used in the experiments can remain dangerous for decades.¹²⁴

1982 – Cuba claimed the United States was disseminating Dengue and Swine fever viruses, causing epidemics among humans and pigs in Cuba.¹²⁵

1983 – The FBI obtained one ounce of ricin in a 35-mm film canister from an individual in Springfield, Massachusetts, who had manufactured it himself. This is believed to be one of several confiscations of ricin.¹²⁶

Some 750 people were sickened due to Typhoid fever, consequent to bacterial contamination of restaurant salad bars in Oregon, conducted by a local cult attempting to affect the outcome of a local election.¹²⁷

1984 – Australian authorities received an anonymous threat warning that foot-and-mouth disease virus would be released among livestock if reforms in Queensland Prison were not implemented.¹²⁸

A Cuban CW instructor defected and testified that one third of the US could have been contaminated if a stockpile of toxins held by Cuba were to be "strategically placed in the Mississippi River".¹²⁹

In the US, Tylenol contaminated with arsenic was found in drug and grocery stores. Several deaths resulted.¹³⁰

Two Canadians attempt to procure tetanus and botulism cultures from ATCC. Reportedly the first phone order, of less deadly cultures, was fulfilled, and it was not until the second order that ATCC employees become sufficiently suspicious to notify authorities.¹³¹

- 1985 – Soft drink and milk dispensers in Japan were contaminated by paraquate pestic.¹³²
- 1986 – In the United States, after a series of incidents in which people died after taking Tylenol capsules laced with cyanide, extortionists throughout the country tried to blackmail companies with threats of product contamination.¹³³
- In India, the disclosure by a terrorist suspect that other terrorists might poison drinking water tanks led to a statewide alert.¹³⁴
- In Japan, the “Man with 21 Faces” extortion group placed cyanide-laced candy on store shelves to obtain money from the Morinaga Candy Company.¹³⁵
- Tamil guerrillas in Sri Lanka sent letters to the embassies of several Western nations claiming to have put potassium cyanide in Sri Lanka tea that was destined for export.¹³⁶
- 1987 – A threat was made to overfly Cyprus with a microlight plane that would saturate the area with aerosol borne poisons.¹³⁷
- 1988 – Minute traces of cyanide were detected in two Chilean grapes, resulting in the quarantine and recall of all Chilean fruit in the United States for several weeks. The Chilean economy was seriously damaged.¹³⁸
- 1991 – During the Gulf War, there were serious concerns in the US, that the ventilation systems of buildings might be attacked by terrorists using BW agents.¹³⁹
- 1993 – An Arkansas man with survivalist group connections attempted to smuggle 130 grams of ricin from Alaska into Canada to use as a weapon.¹⁴⁰
- The Muslim, apparently Middle Eastern, terrorists who bombed the World Trade Center in New York allegedly packed their bomb with cyanide, intending and failing to spread the poison throughout the building.¹⁴¹
- 1994 – An Iraqi scientist specializing in genetic engineering and implanted in New York by Saddam Hussein's regime, is intended to conduct an act of biological terrorism, due to having access to various local laboratories.¹⁴²
- 1995 – Two members of the Minnesota Patriots Council were convicted of conspiracy to assassinate a deputy US Marshal and International Revenue Service agents by ricin.¹⁴³
- A member of the white supremacist Aryan Nation acquired freeze-dried bubonic plague bacteria from the American Type Culture Collection.¹⁴⁴
- 1996 – In Texas, 12 laboratory workers at a medical center became ill as a result of eating muffins and doughnuts intentionally contaminated by dysentery germs type 2.¹⁴⁵
- 1997 – The volume of credible domestic C/B-related threats has annually doubled.¹⁴⁶
- 1998 – An Iraqi terrorist network is being maintained in the US, intended to conduct acts of bio-terrorism and reportedly furnished with BW agents by Iraqi women that smuggle agents-filled vials into the US within their bodies.¹⁴⁷
- The British government has issued a warning to all ports about an Iraqi attempt to bring large quantities of the deadly germs of anthrax into Britain (and other countries) inside cosmetics bottles, cigarette lighters and perfume sprays, disguised as duty-free goods.¹⁴⁸
- In addition to the incidents mentioned above, there are some which cannot be discussed at this time. Other incidents go unreported.¹⁴⁹

Assessment and Implications

C/B terrorism today constitutes clearly a non-conventional menace of a particularly severe potential. There are several global trends that may feed each other and bring about a quantum leap in the profile of this menace:

- a. In terms of concept – evolving avant-garde terrorists and pursuing radical modes of terrorism;
- b. In terms of practicality – diminishing effectiveness of conventional terrorism, state-sponsored as well as non-state-sponsored;
- c. Ripen accumulated state-owned capacities of C/B warfare that are improperly converted or channeled, consequent to C/B disarmament processes, thus forming enormous resources for C/B terrorism;
- d. Novel technical avenues that are being evolved in the sphere of chemical engineering and biotechnology and are applicable for C/B terrorism.

The conjunction of those trends is plausible globally, yet it is apparently most probable in the Middle-East. The Middle East is marked, indeed, by traits and courses which could form an acute shift from conventional terrorism to non-conventional. It seems as if the buds are already there. The Middle East is indeed the area where the speed and extent of arming, both with conventional and non-conventional weapons, is the highest, in the world. The polarization between Israel and Arab states plus Iran is increasing. Israel is at any rate the most threatened country on the globe, strategically and militarily. Some Moslem states in the Middle East are prone to taking extreme measures by nature, and at times politically unstable. Terrorism is currently active and is conducted both through state-sponsored mechanisms and non-state sponsored mechanisms. Possession and availability of chemical and biological weapons are becoming self-evident over the Middle East, and this regional proliferation is inevitably assimilated within terrorist organizations, at least conceptually. Various “legitimate” terrorist organizations are commonly supported by Arab states and Iran with respect to the conduct of conventional warfare. At the same time, those states are anxious to have and cultivate C/B weapons.

Deductively, all of these circumstances may generate and encourage reflections, to say the least, on the usability of C/B weapons by Middle East terrorist groups, particularly against Israel. Thus, the next steps are acquisition and employment (which already has taken place, in a sporadic manner, as described above) of C/B weapons by terrorists. This is not going to be a too heavy task. Existing chemical laboratories for explosives would be capable of handling poisonous materials, and regular microbiological laboratories affiliated with hospitals or universities could readily support handling bacteria. The fact, as mentioned above, that most of the areas of Israel are fed by streams originating in Arab controlled areas in Judea, Samaria as well as areas populated by Arabs in Northern Israel and Southern Lebanon, may certainly facilitate deliberate contamination.

All in all, this is evidently a pessimistic picture, which has to be coped with. The two main directions are, naturally, prevention of and managing events of C/B terrorism. Recently, major efforts have been taken by the USA towards the threat of C/B terrorism, and the American program crystallized and run in relation to this area of concern is fairly comprehensive. In Israel the scale is, of course, quite different, yet the American program is a proper model, basically, and a degree of preparedness has at any rate been achieved already in Israel. Hence, in practical terms, this would mean, primarily, that the two already existing Israeli systems – for preparedness towards terrorism events, of whatsoever kinds, and towards C/B events – should rather form a joint task force aimed at handling C/B terrorism issues and incidents. Such a task force ought to give rise to an intelligence function of its own, though this function would definitely be fed, closely, with data worked out through the three institutionalized intelligence systems, namely Mossad, Shabak and Aman. The intelligence function should indeed have a major, if not crucial, role throughout assessments and projections related to basic, current and acute matters of C/B terrorism. Strict intelligence monitoring of bio-chemical

infrastructures, even if seemingly trivial, and of relevant professional manpower, is essential. Current gauging of evolving intentions and plots signifies much.

Based on profound incorporation of intelligence data, steps to be taken both conceptually and practically should be considered. Such steps could be useful in terms of preemptive actions, foiling, political preventive moves, detection of C/B terrorism upon occurrence, rapid identification of C/B substances employed, and protecting people and environments at risk, pre-factum and post-factum.

Thus, the Israeli attempt to poison a Hamas leader in Jordan should have dual meaning: on one hand, the fact that this incident has largely been compensated for (practically and politically) should imply that this sort of warfare is and would be unbearable if repeated by anyone; on the other hand, the incident in itself should indicate the Israeli in-kind retaliation would be feasible, whenever possible.

Moreover, the escalating level of C/B terrorism threat, as described in general and in detail, particularly in the Middle East, should bring about an Israeli stressed and repeated warning, that would totally condemn C/B terrorism of any sort and any origin. C/B terrorism aimed at non-Middle Eastern countries though induced by Moslem Middle Eastern countries, or organizations, should be traced meticulously as well. In relation to this concern, specific cooperation with foreign intelligence agencies should be maintained and increased, so as to improve preparedness.

The existing Israeli system for handling C/B events in general may certainly cover various aspects related to C/B terrorism events, yet there are aspects of C/B terrorism that need further attention, especially the detection upon, or as soon as possible after, occurrence. This cardinal stage is naturally problematic since C/B terrorism may predictably be conducted covertly, and therefore there has to be an elaborate monitoring mechanism addressing this need. Finally, the aspect of public awareness is of great significance. This element demands treading the kind of delicate line between enhancing public realization of the C/B terrorism threat to avoid underestimation of the danger posed and a balanced assessment to negate panic. Such a goal is achievable through careful well calculated information release. ■

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