The Chemical and Biological Threat of Islam

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BACKGROUND AND MAIN MILESTONES

On June 8, 1963, during a raid on native anti-Communist villagers in Yemen, the Egyptian Air Force employed aerial bombs containing chemical warfare agents. It was the first time chemical weapons have ever been used in the Middle East. That event marked the beginning of the Islamic non-conventional weapons era, an era bearing enormous strategic importance. During the 40 years since that time, Egypt and other Islamic states have armed themselves with dreadful chemical and biological weapons, forming a region of the world most intensely engaged in the acquisition of offensive chemical and biological capabilities. In conjunction with rapid ballistic proliferation in the Islamic countries of the Middle East, this development constitutes a strategic turn of paramount significance.

Egypt was the Islamic state that pioneered the procurement of chemical weapons. These were employed by her repeatedly from

1963 until 1967 against unprotected Muslim civilians in Yemen, far and away from the Egyptian borders. Later, chemical weapons were further employed again on various occasions, without hesitation and on a large scale, by Muslims against Muslims.

Iraq used chemical weapons many times against Iran throughout the lengthy war between the two countries (1982–88). The target population was often a civilian one. Thus far the climax of Iraq's brutality on this score was the massacre of some 4,300 Kurdish residents of the town of Halabja by chemical weapons. Also noteworthy are the numerous incidents where the Iraqi regime brought about the assassination of individual opponents by thallium poisoning. Biological weapons were used as well by the Iraqi regime against the Kurds.

In 1982, the Syrian regime killed some 18,000 "undesirable" Syrian *Sunni* residents of the city of Hamma, primarily by means of cyanide. Three years before that horrifying event, in 1979, while conducting a vigorous effort to suppress religious dissidents occupying the holy *Ka`abba* of Mecca, the Saudi regime effectively employed on a massive scale a potent incapacitating CW agent, probably benzyl chloride, acquired for that purpose from France.

The cases mentioned here point to the distinct possibility that chemical or biological weapons of any sort might readily be used by Muslims against non-Muslims.

The disintegration of the USSR gave birth to new Islamic states throughout the last decade, which greatly facilitated the proliferation of chemical and biological weapons. Inevitably, these countries formed inter-nation connections for the transfer of the relevant technology. The relatively young Islamic state of Kazakhstan, for example, has mastered crucial technologies related to both chemical and biological weapons, hitherto possessed by the Soviet Union. Kazakhstan found itself in the position of being a potential key supplier, with the option for choosing one of the three alternatives:

a. responding positively to requests from her Islamic sisters

b. relating with indifference to such requests

c. actively hindering the migration of such technologies to other countries

On occasion it follows the second option, more frequently the first one. In effect, the intra-Islamic migration of this specific expertise began 1972. At that time, Egypt supplied Syria with chemical weapons produced in Egypt to provide Syria with an initial unconventional operational capability toward the October 1973 offensive against Israel. The Egyptian-Syrian connection, in preparation for the October 1973 War, constituted the most profound strategic-military-operational cooperation configured during the 20th century in the Islamic world, including, evidently, the element of offensive chemical capacity.

The Egyptian-Iraqi connection during the 1980s was aimed at the development and production of various ballistic missiles with warheads carrying all types of non-conventional armaments.

Politically, the Islamic states that so far avoided the biological and/or chemical conventions — namely Egypt, Syria, Libya, Iraq, Lebanon, Algeria, Morocco, Sudan, United Arab Emirates, Afganistan, Kazakhstan, Azerbaijan, and Kyrgystan — sustain a degree of coordination between them.

CONCEPTUAL FOUNDATIONS

The basic assumption of the Islamic system is that Israel possesses nuclear, biological, and chemical weapons. This constitutes a sufficient factor (though not a mandatory one) for an Islamic view supporting acquisition of chemical and biological weapons, alongside or instead of nuclear weapons. This view is shared mainly by the Arab world and Iran, and is approved by Pakistan and other peripheral Islamic countries. It constitutes the reason and/or excuse for continued efforts to acquire chemical and biological armament.

On a public and political level, this concept serves as a bargaining chip and as a stick with which to browbeat Israel into disarming itself in the realm of chemical, biological, and nuclear weapons. This concept is also fed by other factors, among them internal Arab affairs as well as Arab concern for protecting the balance of weaponry between Arab countries and Iran on both an actual and symbolic level. These concepts have been nurtured by the fact that Israel was victorious in all the wars; by the dramatic effect chemical weapons played in Iraq's war against Iran; by the relative ease in obtaining biological and chemical arms; and by the

fearful image of such weapons. In practical terms, such weapons have great weight because their destructive ability allows them to serve as a tremendous threatening device, creating threat levels far higher than with conventional weapons both as deterrent, retaliatory, and as attack systems.

In addition to Iran, one has to recall that, among Islamic nations, Pakistan maintains profound relations with Iran and Arab countries, and it also believes in arming itself with nuclear, biological, and chemical weapons altogether. Furthermore, outside the Islamic orbit, North Korea holds a similar view, while maintaining close ties with Islamic countries such as Syria, Libya, Egypt, and Iran.

We shall examine the threat situation in each of the relevant countries.

SYRIA

Basic Characteristics

Syria has a consistent policy of biological and chemical arms acquisition that is systematic and determined, and has never been denied by Syria. More than any other country, Syria has a policy of seeking strategic parity with Israel, which, in military terms, means attaining biological and chemical weapons.

Syria apparently cooperates with Egypt in biological and chemical arms acquisition today; it certainly does with Iran and probably with Libya.

One must recall that Syria has switched from above ground to underground storage and production facilities, thus significantly limiting Israel's ability to detect and destroy such facilities.

Chemical Weapons

In 1972, Syria received aerial bombs and artillery shells from Egypt containing Sarin nerve gas and blistering mustard gas. Ten years later, it began production of Sarin for aerial bombs and later for Scud missiles. Syria also possesses reserves of cyanide gas which were used in part in the slaughter of 18,000 Syrian *Sunni* residents of the city of Hama in 1982.

In recent years, Syria has produced the deadlier and more stable VX nerve gas placed on bombs and in missile warheads.

This chemical agent surpasses Sarin in its toxicity, persistence, and virulence, thus complementing the operational flaws of Sarin. Syria was helped in these efforts by Russian scientists specializing in the Russian version of the gas, which is superior to the original American version. Recently Syria deployed chemical warheads on its Scud-C missiles. This is in addition to the aerial chemical bombs on its *Sukhoi*-22, *Sukhoi*-24, MIG-23 and some 200 chemical warheads adapted to Scud-B missiles. It is to be expected that Scud-D will follow.

The warning from the Syrian ambassador in Egypt that Syria would threaten the use of its chemical weapons against Israel to counter an Israeli chemical threat set a new level for this kind of statement. In January 1989, in a conversation with Senator McCain in Damascus, Assad confirmed that Syria had chemical weapons. In 1993, Assad hinted that Syria had a way to win the Golan back at any price, despite Israel's nuclear superiority. The Syrian Information Minister said in 1995 that Syria had "cards" it had not yet played, but which it would be willing to employ in a war with Israel. Assad has declared lately that Syria can cause great damage to Israel through the "special armament" it has, because the Syrian army has reached strategic balance with the IDF. The Syrian army did indeed perform a series of experimental launchings of different versions of Scud missiles tipped with chemical warheads. This activity points to an experimental program that American experts believe could lead to the use of chemical warheads if Syria intensifies its cooperation with Russia in the field of chemical weapons. Moreover, the exposure of the Syrian operational system of Scud-C missiles through satellite photographs, shows that it includes chemical weapons that provide Syria with the option of carrying out a surprise chemical attack. Parallel to this, the exposure of the nuclear operational system attributed to Israel by the well-reputed *Jane's* newspaper, as well as satellite photographs, allow Syria another major military option of directing a chemical attack at this system.

This cluster of developments makes clear Syria's intention to neutralize Israel's nuclear threat which might otherwise endanger Syrian military gains in the Golan Heights, if and when Syria decides to initiate action there using chemical weapons.

Biological Weapons

Syrian spokesmen have stressed that Syria is arming itself with a technical response surpassing Israel's nuclear arms, an allusion to biological weapons. These comments underscore a Syrian concept that even if chemical weapons are not sufficient to undermine Israel's nuclear deterrent, the addition of the even more powerful biological weapons will certainly complete the job.

Syria has been developing such weapons since 1985, producing botulinum toxin and ricin toxin, as well as anthrax and cholera germs. Russian experts recently hired by Syria are involved in the production of anthrax and its weaponization in missile warheads. The biological agents mentioned earlier are particularly deadly: botulinum is a poisonous protein made from a bacterium that surpasses the lethality of any other natural or synthetic substance; ricin is another deadly protein (made from castor beans, commonly grown in Syria) which has an optimal cost-effective ratio; and anthrax, an easily grown bacterium with long-term survivability for purposes of storage, eventual launching, and ability to last in the environment. Cholera bacteria are very suitable for contaminating water and food systems through guerrilla warfare.

EGYPT

Basic Characteristics

In addition to supplying Syria during joint plans for the Yom Kippur War, Egypt supplied chemical and biological weapons, and the means to manufacture them, to Iraq in the 1980s. It continues to maintain such arms, despite denials and despite consistent efforts to form the image of a country that wants to eliminate such weapons.

Since the 1993 Chemical Weapons Convention, there is a clear inter-Arab concept, led by Egypt, to refrain from joining the Convention, and to develop a chemical-attack option as well as a biological option, as Egypt has done, so long as there is no across-the-board regional ban on chemical, biological, and nuclear weapons in the Middle East. When the Chemical Convention was signed in January 1993, Mubarak was in Damascus with Assad, and both called on Arab states to refrain from joining the Convention.

During 1990, Egyptian-Iraqi cooperation in ballistic and biochemical armament reached its peak. Indeed, only a short while

before Iraq's invasion of Kuwait, Egypt's defense and foreign ministers defended Iraqi acquisition of chemical and biological weapons, hopeful of reaping fruits from the Egyptian-Iraqi cooperation.

Against the background of Egypt's immense and unprecedented financial expenditures on its military power, and Egypt's non-participation in the chemical and biological weapons conventions, it is reasonable to assume that its military arsenal includes chemical-biological arms, contrary to public declarations by the top Egyptian leadership.

Chemical Weapons

Egypt's acquisition of chemical arms began in the 1960s with the principal installation in Abu-Za`abel (backed by local pesticide plants) and secondary installations in Abu Rawash (production of sprays) and Beni Sueif (an air force base). The main research and development area is in Dokki, and a support industrial installation is in the Egyptian Chemicals and Dyes Manufacturing Company.

At first, Egypt manufactured mustard gas (blistering) and phosgene (suffocating), using them in Yemen. Later, it developed Sarin nerve gas and VX nerve gas. These were all made on an industrial level and loaded in mines, artillery shells, aerial bombs, rockets (including cluster warheads), and finally missiles warheads. After the suspension of the Egyptian-Iraqi-Argentinean Condor Project, which the Egyptians and Iraqis wanted for chemical and biological weaponry purposes, the Egyptians turned to arming other missiles. Most probably this arming process has been completed. Concomitantly, many Egyptian experts have taken part in international forums where they attained knowledge and access in the field of chemical arms.

Biological Weapons

Anwar Sadat (in 1972) and Saddam Hussein (in 1990) were the only two Arab leaders until now who unequivocally declared, one 18 years before the other, that Egypt and Iraq had biological weapons on an operational level. Both were telling the truth.

Egypt began a combined chemical-biological weapons project in the 1960s code-named "*Izlis*." It took place (and probably continues to take place) at an Egyptian military-civilian consortium located at Abu-Za`abel that includes a military installation called

Industrial Plant Number 801. This is an industrial plant known as Abu-Za`abel Chemicals and Pesticides Company. A second site is a facility at the El-Nasser Chemical Pharmaceuticals and Antibiotics Company.

At the beginning of the 1970s, about ten years after the start of the project, and after stocking chemical weapons used operationally in Yemen, it seems that Egypt indeed also stockpiled appreciable quantities of biological weapons on an operational level, as well as the means to launch them. It also appears that Sadat's statement was not a chance utterance but timed to coincide with a decision to launch a surprise strike at Israel, and thereby strengthen Egypt's deterrent ability to preclude an Israeli non-conventional counter-strike of any sort.

"The Plagues of Egypt," which included "pestilence" and "murrain," have been preserved to this day, enabling Egyptian scientists to imitate the plague-producing agents as biological warfare agents. Indeed, Egypt's relatively advanced biotechnological abilities allowed it to deal with these two agents. The production and storage of the former agent, the plague (pest) bacterium, are not at all simple, while the latter one, the Rift Valley fever virus, is even more complicated to handle. To this, one must add Egypt's development of additional biological warfare agents, as, for instance, botulinum toxin and a virus that causes encephalitis, as further biological warfare agents.

LIBYA

Basic Characteristics

Libya has conducted a very wide biological-chemical weapons acquisition program, though seemingly only partially productive for the time being. In September 1983, the CIA already believed that Libya had chemical weapons. Since then, Libya has come a long way. Qadhdhafi has repeated several times that Libya has the right to acquire chemical and biological weapons no less than any other country, especially those already armed with weapons of mass destruction. And he transfers this right to the entire Arab world, although recently he has pledged to abandon Libya's weapons programs.

Indeed, immediately after the establishment of the Chemical Weapons Convention, Qadhdhafi met Mubarak to coordinate with

him the steps to be taken by the entire Arab world. Only a few years earlier, Mubarak had said that, unlike the lies of Libya, Egypt had no chemical weapons and had no desire to acquire them. Syria was the only Arab country to defend Libya, which had tried in vain to conceal a massive chemical arms factory as a pharmaceutical plant. This comment also hinted at the cooperation between Syria and Libya along the Libya-Syria-Iran-North Korea axis of missile and biological/chemical weapons development.

Simultaneously, Libya is a partner in North Korea's development of long-range missiles (along with Iran and Syria) — the *Nodong* (1,000-1,300 km) — which are ultimately intended, evidently, for carrying chemical and biological warheads. This would boost Libya one step up as a potential threat *vis-à-vis* Israel and Europe. Other missiles in the Libyan ballistic program include the TD-1 and TD-2 (2,000-3,500 km) plus the OTRAG (2,000 km). Regretfully, the Libyan biological and chemical effort receives very significant support from South Africa.

Chemical Weapons

The Rabta complex can easily be switched to its original purpose of chemical weapons production at any time. The complex was inaugurated in the presence of the Egyptian Health Minister in September 1995. The plant is said to supply pharmaceuticals to the entire Arab world, inasmuch as it is supported by an Egyptian company, the El-Nasser Pharmaceutical Company, which provides support for Egypt's chemical-weapons factory. In December 1994, the CIA director said that Egypt and Libya were cooperating in the manufacture of chemical weapons. Libya is also cooperating with Iraq, Syria, and Iran in this field. Hence, the Libyan effort is unique in that it unites all five threatening countries.

Meanwhile, the Libyans found it wise to transfer activities to huge factories tens of meters beneath the ground, thereby creating two advantages: removal, or significant decrease, of the threat of satellite recognizance as well as the threat of being bombed. Indeed, the American director of Central Intelligence stressed these two difficulties when surveying Libya's extreme acquisition policies. He said joint international action could only delay the process but not prevent it.

Two new additional chemical installations are located at Sebha and Tarhuna in underground tunnels dug into mountains. These projects are camouflaged as civilian projects aided by contractors from around the world. The construction plans for the Tarhuna factory, described as the largest chemical arms plant in the world, were obtained by German intelligence from German and Austrian contractors, and there is great concern that they have reached Syria as well as Iran.

Biological Weapons

In addition to the three chief chemical weapons facilities mentioned above, which most probably contain hidden wings for biological weapons, Libya attempted to conceal her biological weapons program within two installations: the "Microbiological Research Center" and the "General Health Laboratories." In the field of biological weapons Libya developed two germs — anthrax and brucella — as well as botulinum toxin, as biological warfare agents, an effort assisted by foreign firms. It is fairly reasonable that Libya has already begun to produce and accumulate biological weapons.

IRAN

Basic Characteristic

Iran is the most advanced Islamic country in the Middle East, technologically and scientifically. Moreover, being a non-Arab Islamic state, it has a key role within the Islamic block in general, and in regard to the proliferation of chemical and biological weapons in particular. Further, it is possible that Iran constitutes the greatest biochemical threat for the following reasons:

- Its present biochemical armament procurement and its future nuclear armament procurement are the result of a long-term strategy, supported by significant capital and by careful supervision.
- Its membership in the Chemical and Biological Conventions, despite the fact that it is arming itself with biological and chemical weapons (which it denies)
- Its emphasis on long-range missiles carrying biochemical warheads, and interest in an aircraft carrier

- Its fostering of terrorist capabilities, which include chemical and especially biological terrorism
- Its outstanding strategic interface with Syria
- Its Muslim fanaticism and enmity to Israel
- The remarkable profusion and physical decentralization of the installations included in the system, responsible for development, production and warehousing of chemical and biological warfare agents and of delivery means — located in Teheran, Isfahan, Kharge, Karai, Marv-Dasht, Shiraz, and Bandar-Khumeiny
- There was no substantial change in the policy and in the acquisition of strategic weapons following the change of regime

Iran has succeeded in obtaining significant assistance from countries that have mastered key technologies. There is evidence of a recent increase in the aid Iran receives from China, Russia, North Korea, Pakistan, and South Africa, for its chemical-biological efforts. Concomitantly, there is extensive aid coming from German firms, largely the same firms that previously helped Iraq and as such, those firms have earlier been condemned, ironically, by Iran — a typical line of deceit by the Iranians — many of which compose the strategic Iranian concept.

Chemical Weapons

Iran learned more about chemical warfare than any other country in the world from the bitter experience of seven years of attacks by Iraq. Such cumulative experience has ramifications for Iran's chemical weapons acquisition program. During the war, Iran tried to manufacture its own chemical weapons, but it deployed them in a limited way only. Yet, by the end of the war, Iran had accumulated vast experience in the production of chemical weapons. Today it has such weapons on artillery shells, aerial bombs, rockets, and very likely on missile warheads as well. The chemical warfare agents it produces include: cyanide, mustard, luwisite, phosgene, tabun, and Sarin.

Biological Weapons

Iran is working relentlessly in the realm of biological weaponry. It has vast and sophisticated biotechnological infrastructures at its disposal along with skilled manpower. It therefore has only limited need for outside assistance, and its biological weapons program should bear fruit in the near future. Its biological weapons dovetail with those produced by Syria: botulinum, ricin, and anthrax. Still, its production capacity, especially of viruses, is far greater than that of Syria, and it undoubtedly aspires ultimately to achieve biological warheads for long-range missiles.

The Iranian effort to equip itself with biological weapons is accentuated by assistance from Russia. Russia contributes to the offensive biological capabilities of Iran at the operational level to the extent that, according to American intelligence sources, Iran's biological arsenal will have the power nearly equivalent to a nuclear effect. Nor has the importance of biological weapons in the context of terrorist actions escaped Iran's view, and it equipped itself with the means for guerrilla-warfare intended to employ biological agents by spraying and by the contamination of water systems.

PAKISTAN, KAZAKHSTAN, AND OTHER EMINENT ISLAMIC RESOURCES OF TECHNOLOGY TRANSFER

The Islamic system is blocked, chiefly by Israel and her only Islamic (NATO member) ally, Turkey, on its western wing, and by inferior African countries on its southern wing. Direct geographical interface allows for the effective transfer of technology and skills through the northern and eastern wings of the Islamic system of nations, and they do indeed function in this manner. Pakistan, the most advanced Islamic state, borders on the powerful nation of China, with which it maintains close and productive ties, and sensibly shapes the eastern connections of the Islamic nations. Being in such a paramount position, Pakistan constitutes an extremely important source of know-how and technology in itself, as well as a crucial bridge for the migration of essential expertise and components from the Far East, China, and North Korea in particular.

Moreover, the common border found in between Pakistan and Iran enables direct technology transfer. Movements of specialists, chemicals, components, know-how, or even weapon systems can-

not be effectively monitored or detected thereupon. Also, Pakistan repays Libya and Saudi Arabia for the massive financial assistance they provided by advancing their nuclear and CB weapons development. All in all, the major contribution of Pakistan as an Islamic CB weapons proliferator cannot be measured as yet in realistic terms since it has been developed in secrecy. It is obviously significant, in any event.

The other Islamic peripheral country, Kazakhstan, though undergoing an opposite process, namely deproliferation, evidently still plays a similar role in regard to countries to the north. The disintegration of the USSR gave birth to several new Islamic states on the northern periphery of the Islamic system, including Uzbekistan, Tajikistan, Azerbaijan, Turkmenistan, Kyrgystan, and, the most northerly, significant, and largest one, Kazakhstan. The latter completely masters technologies related to all types of nonconventional weapons even though it proclaims that it is currently committed to total disarmament. The big sister, Russia, is situated to the north, whereas the Islamic little sisters shorten the distance to the Iranian, Pakistani, and Afghani borders. The paradoxical phenomenon emerging within this peculiar context is in that the more a particular nation declares that it is complying with the convention, the more resources of critical technologies and specialized manpower in that country become available to developers in other countries. That is precisely the case with Kazakhstan and some of her nearby Islamic sisters. One manner by which this worrisome situation is manifested is the knowledgeable "scientific mercenaries" that find their way to the Middle-Eastern Islamic developers.

Kazakhstan inherited large and advanced CB facilities from mother-USSR: two huge chemical weapons production facilities, one at Pavlodar and the other one at Zhambul — the former containing very sophisticated installations — and a chemical weapons storage facility on the Ili river. Furthermore, four major biological weapons facilities have been active in Kazakhstan: the so called Scientific Experimental and Production Base in Stepnogorsk (including a major Soviet anthrax brewing plant), the Vozrozhdenie Island open-air test site in the Aral Sea, the Scientific Research Agricultural Institute in Gvardeyskiy, and the Anti-Plague Scientific Research Institute in Alma-Ata.

Not expecting her own disintegration, the Soviet Union did not bother to concentrate her gigantic biological and chemical efforts within Russia itself, and various facilities situated in other parts of USSR were actively involved in the program. In Uzbekistan, for example, the Institute of Genetics, Tashkent, has for years been working on biological weapons to be used in agriculture, an advanced form of economical bio-warfare. A marginal country like Armenia, for instance, appears to possess chemical weapons originating in Russia. Also, it has been reported that Islamic segments still belonging to Russia, like Chechnya, have usable CB weapons.

Plausibly, one may assume that given the proper payment, the Islamic brotherhood overcomes obstacles that would otherwise hamper the migration of essential biochemical technologies, or even entire CB weapon systems or their components. Movement of these technologies, particularly through common borders, is taking place from peripheral Islamic countries into the Middle East. In practice, that is how it happens.

CHEMICAL AND BIOLOGICAL TERRORISM

The nature of many chemical and biological warfare agents allows them to be used by non-regular militants, namely saboteurs, in a very effective and horrifying manner. One of the greatest fears in the West, especially in the United States, concerns chemical and biological terrorism. This fear centers around terrorists who would function as human launchers, such as suicide bombers, in the extreme. They could be armed with such weapons by a terrorism-oriented Islamic country or by some Islamic organization acting on its own. Candidates include Iran, Libya, Syria, Sudan, and Algeria in terms of state-sponsored terrorism. *Al-Qa`idah* (headed by Osama bin-Laden), *Hizbullah*, *Hamas,* and *Tanzim* are the current candidate organizations prepared to conduct biochemical terrorism. The anthrax letters attack against the United States has been, unfortunately, a concrete illustration. Biochemical guerrilla warfare may be conducted without the possibility to trace the sponsor, be it a country or an independent organization. Not surprisingly, the threat of Islamic biochemical terrorism concerns even Russia, considering how Chechnya might act. Technically speaking, the feasibility of such a scenario is quite high, with the target being located in Israel,

the United States, or elsewhere. Of particular concern in the United States is the problem of preparedness to face biological terrorism and whether it is being addressed by American authorities.

The leading Islamic organization to take practical steps to attain an operational biochemical capacity is *al-Qai`dah*. It has been implicated in what is called "multi-track biochemical microproliferation."

Al-Qa`idah is not the only Islamic organization that is a cause for worry in terms of biochemical terrorism. Former CIA director James Wolsey described the *Hizbullah* as a potential agent for biological terrorism. This is particularly realistic due to the fact that the *Hizbullah* is directly supported by Iran. Iran possesses various CB weapons, including specific means designed for guerilla operations.

One reason for the extreme position of the Syrians concerning their stipulated access to the Kinneret (Sea of Gallilee) could have been the feasibility of contaminating it.

Finally, the Palestinian terrorist organizations should be mentioned. Certainly, the *Hamas* and *Tanzim* are aware of various options that may be employed in biochemical terrorist acts against Israeli targets. Actually, during the past two decades Palestinian terrorists attempted sabotage by toxic materials in about a dozen cases, apparently on individual initiatives. Nevertheless, there is gradually increasing awareness within the *Hamas* regarding possible use of poisonous substances for purposes of sabotage. On several occasions the *Hamas* already attempted to carry out that mode. Also, one cannot rule out the possibility of "an ecological *intifada*" directed at poisoning the water sources in Judea and Samaria that serve Israel's Coastal Plain, inhabited primarily by Jewish citizens. The Kinneret might be regarded to be a preferable target for contamination by potent radioactive materials.

THE EVOLVING THREAT TOWARD EUROPE AND THE UNITED STATES

The biochemical threat posed by the Islamic block toward Israel is self-evident, and in time might take shape. This is but one dimension of the Islamic menace. As noted earlier, most Islamic countries that possess offensive biochemical capabilities seek to equip themselves with long-range ballistic missiles of up to thousands

of kilometers, covering areas much wider than their immediate environment. The very long distance that missiles can traverse also goes far beyond their relevant strategic geopolitical arena, a fact that should arouse considerable amazement since it presents the obvious danger of a capacity to deliver chemical and biological agents to targets far away.

This biochemical-ballistic capacity even goes far beyond the needs resulting from the strengthening cooperation between Turkey, the Muslim country that separates Europe and the Middle East and belongs to the NATO, and Israel. This cooperation serves as an excuse for the ostensible need for Islamic nations to cultivate multiple chemical-biological offensive strategies whose potential goals include Israel, Turkey, and a large part of Europe.

The 21st century will probably see enormous scientific biotechnological developments. Unfortunately, these developments will entail enormous unwanted military implications, and will significantly intensify the biochemical threat. Ballistic delivery systems for biochemical warfare agents will improve considerably. Also expected is the addition of biochemical warheads that contain cluster bombs armament that are carried by cruise missiles, thereby greatly increasing the threat. The leading Islamic countries are in all probability seeking to master those developments.

What the future threatens to produce is a "biochemical monster turning on its creators." For years the United States and various European countries, or, more precisely, many supply firms in Europe and the United States, have been contributing extensively and critically to this irreversible process. In practical terms, it means that in approximately five years or so, an ordnance of surface-to-surface ballistic missiles armed with warheads containing CB agents, might be deployed within the premises of Iran, Syria, and Libya, capable of reaching remote targets in Europe as well as in the United States. The chances of such a scenario taking place, in terms of both deterrence, retaliation, and threat of and first use, can be determined only in the future. At any rate, an impending shift in the balance of power is about to occur.

Further, the implementation of the chemical convention and the perfection of the biological convention should facilitate putting controls on the suppliers of prohibited biochemical technology,

particularly in Europe and the United States, although past experience teaches that, in most cases, suppliers found ways to bypass the controls. The name of the game, in this connection, is early and much better intelligence as well as persistent determination.

THE OVERWHELMING MENACE OF BIOLOGICAL WEAPONS

During the recent decade, biological weapons re-emerged as ultimate practical weapons of mass destruction, in terms of both guerrilla warfare and large-scale warfare, whereas nuclear weapons constitute the ultimate weapon of deterrence. Mention should be made of the broad impact of biological weapons, which may be fully strategic and widely explosive, even when employed by means of guerrilla warfare. Also, biological weapons hold the ratio of cost to efficiency at its desirable limits that meets the needs of developing countries seeking non-conventional armaments which are not too complex to handle. Nuclear weapons are enormously more sophisticated and expensive, and they retain their status as the super deterrent weapon of mass destruction. Yet, the increasing attainability, diversity (toxins, non-epidemic pathogens, and epidemic pathogens), and versatility of biological weapons make them attractive to rogue regimes in search of a weapon with massive impact.

A lot has been said, and evidenced, with regard to the anticipated devastation resulting from the employment of the two supreme biological warfare agents, the anthrax bacterium and the smallpox virus. In practice, the former is an available, readily cultivated, highly infective, and yet non-contagious pathogen, marked by extreme environmental stability, remarkable virulence, and considerable sensitivity to certain antibiotics. The virus causing smallpox is an already globally eradicated pathogen, and, hence, difficult, but not impossible, to obtain. It is easily reproducible in fertilized chicken eggs, highly infective and contagious, less stable but fully resistant to antibiotics, and very virulent. Each of those pathogens is indeed a potent biological warfare agent that can be spread by guerrilla warfare or regular military operations. Regardless of the panic they can generate, which is extremely significant in itself, the affliction they cause directly is horrendous in terms of casualties and medical logistics.

Of interest here are two events during which rulers of Islamic nations threatened to use biological weapons. For quite some time, Iraq (until of course Saddam Hussein's fall) and Egypt have been the most powerful Arab nations, technologically and scientifically. Their presidents, Anwar Sadat (in 1972) and Saddam Hussein (in 1990), were the only leaders worldwide to voluntarily and purposefully announce that they possess usable stocks of biological weapons. Saddam's announcement was delivered a few years after the continuous Iraqi employment of chemical weapons against Iran, prior to the 1990 invasion of Kuwait. Both leaders lacked nuclear weapons, but in view of the fact that their possession of effective chemical weapons was public knowledge, they found it politically beneficial to add their possession of biological weapons.

CONCLUDING REMARKS

Driven by an exceptional conjunction of gradually intensifying pan-Islamic brotherhood and solidifying geostrategic motives, the leading Islamic countries have persistently paved the way of a virtually irreversible CB proliferation process, in contrast to the currently prevailing global deproliferation trends. This proliferation is fueled by two complementary processes: domestic increase and distribution of CB-related know-how, skill, and practical application within the Islamic world, and the simultaneous migration of the necessary technologies from non-Islamic countries. It seems as if the Islamic proliferators act as an absorbing apparatus of portions of the dismantled facilities and dismissed personnel affiliated with past military CB infrastructures located in non-Islamic countries. Intra-Islamic spreading, in parallel, of cardinal biochemical essentials is of no less importance.

The fact that most Muslim nations are full members of the CWC and BWC is misleading, because more than a half of the Islamic states plainly do not have, and do not intend to have, CB weapons. Most possessors are not full members. Iran, though being a major possessor, is a full member, but the Iranian case is distinctly the case of well-orchestrated amazing deception. On the other hand, a non-possessor like Lebanon intentionally refrains from membership, so as to allow the deployment of CB weapons by Syrian forces in Lebanon.

Unfortunately, positive global developments such as the emergence of autonomous nations from the disintegration of USSR, and the worldwide tendency for disarmament and arms control especially in terms of non-conventional weapons, paradoxically played a role of paramount importance in arming Islamic nations with these weapons. This phenomenon is still taking place, and in all likelihood will continue in the future.

The anticipated outcome is the formation of a formidable Islamic menace toward Western countries where their former, and present, suppliers are located. Islamic terrorists, including BC-oriented ones, publicly declare that objective. Turkey, and certainly Israel, the only democracies in the Middle East, are severely threatened by the Islamic proliferators.

The existing geopolitical strategic formation of the Islamic system, together with its adjacent arenas, are plainly in her favor. The likely outcome of that entire conjuncture is indeed threatening. Ranging, potentially, from local small-scale CB terrorism up to the launching of CB-agents-carrying-ballistic missiles on an international scale, the Islamic CB weapons menace is emerging as an extremely serious issue. A future Islamic nuclear umbrella would certainly make matters worse. The fact that the leading Islamic countries are aware of the potential impact of their power propels their incentive for making more progress in this realm. All four modes of action are present: deterrence, retaliation, threat, and surprise attack. Globally, then, chemical and more biological weapons are considered to constitute an imminent menace from Islamic countries. Israel and the West are evidently the first priority targets. The prospects of effectively countering this threat are diminishing as time passes.

Integration of the Islamic world will most likely continue in the future. The reservoir of CB weapons' know-how presently scattered over different Islamic countries should be regarded as a potentially unitary resource of utmost importance, available for concrete armament needs of various Islamic nations.

Disregarding for a moment the Islamic nations that formerly formed part of the Soviet Union, no less than six Islamic countries — Egypt, Syria, Libya, Iran, Sudan, and Pakistan — currently possess chemical and biological weapons, while Algeria and Saudi Arabia

are candidates to join the club. Moreover, in contrast to the ongoing global positive trend of chemical and biological deprolifiration, the prominent and obvious path followed at this time by the leading Islamic countries leads to the augmentation of their chemical and biological capacities.

The described paradigm relates to the global perspective, as well. The formerly Central-European East-West frontline is seemingly being replaced, subtly, by a Middle Eastern one. Syria and Iran presently constitute the new frontline, as against Turkey, Israel, and Jordan — while Saudi Arabia is, in terms of a distinct strategically Eastern-supported Middle Eastern block, opposing a strategically Western-supported one.

COPING WITH THE THREAT

The Islamic countries can use their biochemical weapons the following ways:

- Practical scenarios: conquest, defense, neutralization, paralysis, forcing evacuation, causing massive losses, preventing immediate danger to the regime, damaging strategic targets.
- Threat scenarios: spreading panic, deterring actions or reactions of various opponents; undermining the deterrent capability of opponents.

The two scenarios at the two ends of the spectrum — tactical operation for the purpose of military conquest of a given theater (the Golan Heights, for example) as opposed to a strategic operation against civilian population centers (such as the central coastal area of Israel) — serve totally different aims. There are several interim scenarios, as, for example, an aerial attack on military airfields, on reserve forces call-up stations, and on command and control centers. However, the common denominator and central guiding notion that would precipitate a decision to engage in action, would be the presumption that the use of chemical or biological weapons would have a high chance of devastating essential targets, and that the likelihood of success in any substitute fashion would be low or non-existent.

In the foreseeable future, if and when threatening states possess nuclear weapons, it is reasonable to assume that they will serve as

a nuclear umbrella to an atomic threat against Arab states. Hence, there is no doubt that Iran and others will feel free to use chemical and biological weapons to the extent that they see fit, in the belief that they are protected from nuclear counterstrikes, and are even willing to absorb a chemical-biological attack. A situation such as this will bring about a drastic change in the equation of forces. Assuming for the moment that this development is still far off, one alteration in the equation of forces as perceived by the Arab countries must be taken into consideration: *The Arab and Iranian analysis of the current situation is that biological arms can nullify the threat of an Israeli nuclear counterstrike to a chemical attack launched by an Arab nation or by Iran.*

Unfortunately, in the face of the stockpiling of biological and chemical weapons by Arab countries and Iran, it is presently difficult to identify a way to critically limit the rate of that process, or to prevent new technologies from being available by non-Islamic countries. The North Korean and Chinese formal and semi-official aid extended to Syria, Iran, Libya, and Egypt, along with the informal transfer of invaluable technological knowledge (if not more) from Russia, may well create an incremental jump in the present rate of armament build-up. It is only a matter of time before the stockpiles of biochemical weapons in Islamic countries will include missile-carrying warheads. This will enable those countries to launch BCW from any site in their territory to any location within Israel. In terms of basic strategic time, there is no fundamental difference if this status will be achieved in three, six, or nine years.

Only with a sharp turnabout in the application of restrictions on international commerce, in the support provided by a radical nation such as North Korea, or in the powerful Arab-Iranian motivation to strengthen their strategic alliance in terms of unconventional armaments, can a real change be effected. Present international circumstances being what they are, none of these developments are imaginable now or in the foreseeable future.

The efficiency of physically striking at the source of the threat, such as an air strike on weapons stockpiles or their production plants, demonstrated clearly by the pinpoint surprise bombing of the Iraqi nuclear reactor but shown to be inefficient in the continuous bombings during the Kuwait campaign where the element of surprise did

not exist, remains an option of considerable potential. However, two recent developments have made such an operation extremely difficult: a) underground production plants and storage sites make bombing problematic, and, b) doubts that an Arab country (or Iran) would react with restraint. Preventing the development of a situation which would encourage an Arab leader to utilize biological or chemical weaponry, or to assign the authority for their use to some lower echelon, is of the highest priority.

The following steps could also help target countries such as Israel a great deal:

- A defense capability that would greatly reduce the damage inflicted by a CB attack
- Preparation for an immediate and devastating Israeli reprisal that would include, at the same time, the neutralization of the remaining biochemical attack capability
- Identification of storage sites of CB weapons and production plants, and the creation of immediate and effective attack capability
- Early warning systems to identify such an attack and neutralize it by political or military means, including anti-missiles envelopes
- On the political-diplomatic-psychological warfare level — endeavor to identify an Arab line based on biochemical threatening, which is heightened by acute or continuous brinkmanship, and formulate an opposing operational line based on parallel yet more sophisticated brinkmanship.

There appears to be a sharp increase in inter-Arab and Iranian cooperation. Can this cooperation reach the level of transferring chemical or biological weapons from one nation to another, or to operational strategic coordination in this connection? The enormous threat inherent in this matter requires close attention.

A different threat whose importance and many-faceted ramifications are well known, relates to inter-Arab and Iranian cooperation concerning the international conventions to eliminate chemical and biological weapons. The Arab countries that have not yet signed border

on Israel or currently possess such a potential, including Syria, Egypt, Lebanon, and Libya. An Islamic country such as Iran that signed the convention could demand inspection of installations in another country that has signed, including Israel, the results of which would be passed on to other Arab allies that have not signed. It is difficult to see how this situation can be avoided, except by the adoption of a drastic amendment that would prohibit a country that initiated such an inspection from receiving all of the results even if they were positive. Moreover, Arab states and Iran could coordinate among themselves exactly which installations they would demand to be inspected.

Objectively speaking, the Arab demand for a Middle East without weapons of mass destruction is a positive step. Yet, the difficulty in accomplishing this state of affairs stems from severe, and in some instances, inherent constrains, and it is doubtful that it is basically feasible.

The main difficulty in the eradication of biological and chemical weapons is twofold:

- What is the probability of actually achieving complete (physical) eradication of such arms without the danger of countries hiding them?
- What are the chances of precluding the possibility that the weapons will be recreated within a short time period of time such as days or weeks, and of hiding this capacity?

Finally, what is the probability, in effect, that the Islamic-Arab lineup of forces could be weaned away from maintaining such weapons?

Endnotes

1 Testimony by Dr. Joshua Sinai before the International Relations Subcommittee on Africa of the U.S. House of Representatives, July 22, 1999, U.S. House of Representatives Publications Press, Washington, DC.

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