TRANSNATIONAL THREATS FROM THE MIDDLE EAST: CRYING WOLF OR CRYING HAVOC?

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FOREWORD

There is no doubt that the Middle East can present significant potential threats to the West. The author of this monograph examines these threats in order to put them into perspective—to distinguish between "crying wolf" and "crying havoc." After thorough analysis, he contends that the problems caused by narcotics and organized crime, immigration, terrorism, and weapons of mass destruction do not as yet require draconian action by the Western nations. However, he asserts that if the threats of Middle Eastern terrorism and proliferation were to be combined into super-terrorism, the result would create a new form of asymmetric warfare for which the West is singularly ill-prepared.

Professor Anthony H. Cordesman, an internationally recognized expert of long-standing on these issues, has provided this comprehensive assessment. Presented originally at the U.S. Army War College – Pepperdine University cosponsored conference on Mediterranean Security into the Coming Millennium, held October 26-27,1998, in Florence, Italy, his appraisal is a valuable reference for analysts who are studying the potential consequences of these threats to U.S. security. The Strategic Studies Institute welcomes the opportunity to make his findings available to a wider audience, as well as to contribute to this vital debate on our military strategy.

LARRY M. WORTZEL
Colonel, U.S. Army
Director, Strategic Studies Institute

CHAPTER 1

REAL AND POTENTIAL THREATS

> The boy cried, "wolf, wolf," and the villagers came out to help him.
>
> Aesop
> *The Shepherd Boy and the Wolf*

> Cry havoc, and let slip the dogs of war!
>
> Shakespeare
> *Julius Caesar*, Act III

There is no doubt that the Middle East can present significant potential threats to the West. The Arab-Israeli conflict helped trigger an oil embargo in 1973, and has been a source of consistent political tension. The Iran-Iraq War and the Gulf War have both led to recent Western power projection in the region. Terrorist attacks have occurred in both Europe and the United States, and against Western citizens living and working in the Middle East. The military build-up in the region, and the steady process of creeping proliferation create new threats to a primary source of energy exports, as well as the growing risk of missile attacks on Western states or terrorist attacks using weapons of mass destruction.

The Middle East has also long been a source of transnational threats like narcotics. The failure of most regional states to develop stable political and economic systems, coupled to high birth rates, has created threats in terms of growing legal and illegal immigration to the West. At the same time, the political, social, and economic failures of secular regimes have helped trigger the rise of numerous Islamic extremist groups. Most target their own governments, but some have also targeted the West and Western interests.

Seen from this perspective, there is a long shopping list of "threats" that various Middle Eastern states and political interests might pose to the West. These include:

- New conflicts in the Gulf that threaten oil and gas exports, particularly the risk of some new conflict involving Iraq.

- Energy interruptions, or sudden sharp reductions in total export volume as a result of regional conflicts or internal civil war, and rises in price. This may involve the use of weapons of mass destruction against key oil exporting states and/or energy production facilities.

- Terrorist attacks by Islamic extremists on the West, or on Western citizens and interests in the Middle East. This can include the support of violent, radical immigrant groups.

- The breakdown of the Arab-Israeli peace process and the risk of a rise in terrorism and/or new efforts to use oil embargoes or military threats to pressure Western states.

- Creeping proliferation in a long list of Middle East states, including such potentially threatening states as Libya, Iran, Iraq, and Syria. Efforts to acquire biological and nuclear weapons are often coupled to efforts to acquire long-range missiles capable of hitting targets in the West.

- Increased flows of narcotics as failed economies seek any way of increasing exports.

- Terrorist or low-level state-sponsored attacks on lines of communication through the Mediterranean and Red Sea, and on the flow of energy exports by ship or pipeline.

- New forms of terrorism using methods like advanced conventional weapons, extremely large-scale conventional devices, attacks on critical energy and economic facilities, the use of weapons of mass destruction, and the use of information warfare.

- The collapse of secular regimes in states like Algeria, which could trigger a massive wave of immigration to nations in Southern Europe.

There are other "threats" that are more subtle, but which may prove equally or more serious. One is that the political-economic-social problems in the Middle East, and low oil and gas prices, will lead to underinvestment in energy exports and that prices will rise in ways which limit Western and global economic growth. Another is that the slow deterioration of Middle Eastern states will slowly and steadily increase the pressure to immigrate at rates that Western states cannot absorb. This may lead to serious social unrest.

Military Instability and Conventional Conflicts.

The Middle East has a long history of intraregional violence and conflict. The Arab-Israeli Wars of 1948, 1956, 1967, 1970, 1973, 1982, and the Intifada are cases in point. So are the Iran-Iraq War and Gulf War. While Iran may be becoming more moderate, there is still a serious risk of internal clashes between its "moderates" and "traditionalists." Iraq remains a serious potential threat, and the Arab-Israeli peace process is on the edge of collapse. Morocco remains at war with the Polisario, and there are a host of border quarrels that sometimes lead to conflict. The recent clash between Yemen and Saudi Arabia is a case in point.

There has been a sharp decline in regional military expenditures and arms imports since the end of the Cold War. Middle Eastern military expenditures dropped from $93.0 billion in 1985 to $48.6 billion in 1995, measured in

constant 1995 U.S. dollars. Middle Eastern arms imports dropped from $27.9 billion in 1985 to $48.6 billion. North African military expenditures dropped from $8.3 billion in 1985 to $13.8 billion in 1995. North African arms imports dropped from $3.5 billion in 1985 to $320 million in 1995.[1]

The Middle East is so heavily armed, however, that the drop in arms imports has little substantive impact on war-fighting capability. The region still spends nearly 8 percent of its GNP on military expenditures, which compares with an average of 2.8 percent for both the developed and developing world.[2] The decline in military effort has also not been a matter of choice. It has been enforced by the end to concessionary arms transfers by the former Soviet Union (FSU), growing economic problems, and by a range of sanctions on key states like Iran, Iraq, and Libya. The end result has often been a shift of resources away from large conventional forces to the acquisition of weapons of mass destruction, long-range delivery systems, and carefully selected advanced conventional weapons.

Proliferation is both a threat to the region and to nations outside the Middle East. It creates a growing risk that Middle Eastern states will be able to target Europe and even North America with missiles armed with chemical, biological, and nuclear weapons. This threat is not only "transnational," it is "transregional."

Transnational Threats.

Overt military conflict, however, is only one kind of threat the West must deal with. The Middle East has long been a source of transnational threats like terrorism, and forces are at work which could make these transnational threats much worse.

Some of these forces are political. Most Middle Eastern states have repressive regimes with a high degree of authoritarianism—regardless of whether the ruler is called a King, Shiekh, Sultan, President, General, or Ayatollah.

Recent U.S. State Department country reports on human rights have found some degree of government repression in virtually every country in the Middle East, and significant degrees of state-sponsored and opposition terrorism. Many states suffer from internal conflicts that have already led to terrorist attacks on Westerners or other targets in the West. The civil war in the Sudan seems to be emerging as the longest and bloodiest conflict in modern times, but civil conflict, border clashes, and low intensity combat affect many Middle Eastern states. These states include Algeria, Bahrain, Egypt, Israel, Iraq, Lebanon, Libya, Mauritania, Morocco, Saudi Arabia, Somalia, and Yemen. Many of these conflicts and tensions have triggered the creation of extremist groups, many of them violent and terrorist in character.

These political forces interact with growing economic and demographic problems. Many states suffer from weak or failed economic development, and high rates of population growth. The region experienced negative real economic growth during much of the 1980s, and economic growth only averaged about one-third of population growth during the 1990s—before the collapse of oil prices in 1997. Population growth averaged 2.7 percent during 1995-1996, and exceeded 3.4 percent during the period from the late 1960s to 1990. As a result, real per capita income has dropped or remained nearly static for a generation. The situation has not improved since that time. The region's average per capita income dropped by 1.8 percent during 1995-1996, before the collapse of oil prices.[3]

The Middle East is undergoing a virtual "youth explosion." Roughly 40 percent of the region's population is now under 17 years of age. The region's educational system is under extreme stress, and real and disguised unemployment for males between 18 and 25 years probably averages over 20 percent.[4] The average per capita income of the Middle East is now about $2,100 using the World Bank method, and compares with $23,800 for high income states.[5] Urbanization without development, and proper infra-

structure and housing, has often compounded the region's problems. The percent of urbanization in the total population rose from 37 percent in 1970 to 57 percent in 1996.[6]

This combination of low oil prices, high population growth rates, and a failure to modernize and diversify the overall economy threatens to turn even oil wealth into oil poverty. The Southern Gulf states have only about 40 percent of the real per capita income they had at the peak of the oil boom in the early 1980s, and few prospects for anything other than a slow decline. Kuwait, Qatar, and the United Arab Emirates (UAE) preserve high per capita incomes, but Saudi Arabia is becoming increasingly marginal. Iran has a per capita income of well under $5,000, Algeria has $1,520, and Iraq's per capita income is unlikely to be higher.[7]

It is scarcely surprising, therefore, that many Middle East states suffer from growing internal tensions that have forced them to greatly expand their internal security efforts, and which create new risks of regional instability and terrorism. At the same time, these political, economic, and demographic problems are powerful forces driving the production and export of narcotics and increasing the flow of legal and illegal immigration.

CHAPTER 1 - ENDNOTES

1. U.S. Arms Control and Disarmament Agency (ACDA), *World Military Expenditures and Arms Transfers, 1996*, Washington: U.S. Government Printing Office, 1997, Tables I and II.

2. *Ibid*.

3. World Bank, *World Development Indicators, 1998*, Washington: World Bank, pp. 28-29.

4. There are considerable uncertainties in this estimate. The figures shown are the author's estimate, based on various editions of the CIA, *World Factbook*; World Bank, *World Development Indicators*; IISS, *Military Balance*; and IMF, *World Economic Outlook*.

5. World Bank, *World Development Indicators, 1998*, Washington: World Bank, p. 14.

6. *Ibid*.

7. *Ibid*.

CHAPTER 2

THE DANGERS OF REGION-WIDE GENERALIZATIONS

At the same time, generalizations are dangerous at many different levels. The Middle East is a highly diverse area that includes 21 nations in an arc that ranges from North Africa to the edge of Central Asia and the Red Sea. These states have a total population of some 276 million and a gross national product (GNP) of some $572 billion.[1] Most of these states are Arab and Islamic, but they often share little in political and economic terms. Decades of Pan-Arab rhetoric and failed efforts at regional cooperation cannot disguise the fact that the major trading partners of every Middle East state are states outside the region.

The nations in the Middle East divide into four sub-regions whose nations often have different interests and present different risks. These four sub-region regions include the:

- *Maghreb*, with Mauritania, Morocco, Algeria, Libya, and Tunisia.
- *Levant and the Arab-Israeli confrontation states*, with Egypt, Israel, Jordan, Lebanon, and Syria.
- *Gulf*, with Iran, Iraq, Kuwait, Bahrain, Qatar, Saudi Arabia, the UAE, and Oman, and
- *Red Sea*, Yemen, the Sudan, and Somalia.

These lists include states that have been the source of terrorism or conflict, but they also include many states with a long history of friendship to the West.

The Middle East is further divided into energy exporters and nonexporters. This gives the Middle East great

importance to the West and the global economy because the region has more than 65 percent of the world's proven oil reserves and 40 percent of its gas reserves. At the same time, each exporting state within the Middle East has a different regime and different set of interests. Iran, Iraq, and Libya are sometimes seen as radical or threatening states—but they have little in common. Similarly, Saudi Arabia is a conservative and relatively stable Islamic monarchy that has little in common with an Algeria that is in the midst of a bloody civil conflict.

The resulting problems in risk analysis are compounded by the fact that the "West" has no unity of interest in dealing with the region. The United States, for example, is Israel's most important ally, while every other Western state has attempted to strike a balance between Israel and its Arab neighbors to different degrees. The United States, Britain, and France are the only three Western states with significant power projection capabilities, but their views and interests are only rarely in concert. The Southern European states are far more sensitive to issues in the Maghreb than the rest of Europe, while states like Germany may be more concerned with issues like immigration from Turkey.

"Crying Wolf" or "Crying Havoc."

Terrorism is a real and growing problem, but it must be kept in perspective. Before the West "cries havoc and unleashes the dogs of war," it needs to consider whether it is "crying wolf" and turning uncertain possibilities into urgent probabilities. Complex, modern societies are always at risk, and have many vulnerabilities. Worst-case studies can lead to greatly exaggerated fears and scenarios. For example, similar concerns led to major efforts to study the risk of Spetznaz attacks on key Western communications, transport, and energy systems during the Cold War—a "terrorist" threat that never materialized.

Proliferation and the acquisition of long-range missiles also are real threats, but there is no question that the risks are often exaggerated by those who wish to see immediate, massive investments in missile defense. Similarly, there are a number of nations and opposition groups in the Middle East who see charges about proliferation by their opponents as a tool they can use in mobilizing the West to serve their own interests.

Regional and internal conflicts can lead to reductions or interruptions in energy exports, but it is easy to exaggerate such risks. The panic that followed the announcement of the Arab oil embargo in 1973 disguised the fact that the world market responded quickly and that more oil actually reached the world oil market in the months immediately after the announcement of the embargo than in the months before. While a similar panic followed the fall of the Shah in 1979, improvements in tracking world supply reduced the price and supply impact of the Iran-Iraq War to acceptable limits, and the Gulf War had only a limited impact on the world economy.

At the same time, it is all too easy to "cry wolf." Virtually every trend and potential risk becomes a "threat" when it is carried to logical extremes. Most potential threats do not materialize, particularly in the draconian form often used by strategic analysts. It is also all too easy to transform low-level risks into broad indictments of all Arabs, all Persians, or all of Islam. These kind of indictments are little more than racism. They ignore the fact that the overwhelming majority of the people in the region have no interest in violence or crime, and that Islam is a powerful force for both morality and stability.

Islam is no more a threat to the West than Christianity or Judaism. (Historically, the major threat to Christians has always been Christians.) All religions have their extremists, but it is important to note that Islam is a powerful stabilizing force in most of the Middle East, and that roughly half of the groups on the U.S. State

Department list of Middle Eastern terrorist groups are secular in character. The West has ample reason to remember the warning of a Syrian Muslim poet who wrote during the time of the Crusades: "Most people feel the world is divided into Muslims, Christians, and Jews. It is not. It is divided into those who believe and those who think!"

Who is the Transnational Threat to Whom?

Any analysis of transnational threats from the Middle East must also consider the faults of the West. Some "threats" raise serious questions as to whether the Middle East is a "threat" to the West, or the West is a "threat" to the Middle East. Narcotics are demand-driven, not supply-driven. Western states that cannot control the demands of their own addicts have long tended to blame the problem on supplier states. From a supplier state perspective, however, the corrupting impact of Western demand for narcotics can be a major threat to political stability, economic development and reform, and law enforcement. Certainly, the history of narcotics is the history of supply responding to demand, and not demand responding to supply.

Western nations that exploit the immigration issue to obtain low-cost labor—which is often excluded from social services and citizenship—are in an awkward position in condemning the Middle East, South Asia, Africa, or any other part of the developing world. Once again, supply has responded to demand. The political difficulties Western democracies have in establishing realistic policies towards legal and illegal immigrants are scarcely a reason for raising the fear of the impact of such immigration to near racist levels.

There is also a vast difference between possibility and probability. The fact that the Middle East is virtually certain to be a source of continuing problems for the West is not a reason to claim that any given wolf is already attacking the fold or will do so in the future. Worst case scenarios are great for dramatic impact, but they have a

practical defect for contingency planning. In the worst case, we not only are all already dead, we have never been born. It is certainly possible to construct plausible scenarios in which some Middle Eastern nation or terrorist group does grave damage to the West. In practice, however, there are few “smoking guns” that translate into a high probability that any given threat will become so serious.

The problem, therefore, is to put regional threats in the kind of perspective where it is possible to examine possibilities without confusing them with probabilities. As a result, this analysis examines given categories of threat in ways which attempt to both identify the kinds of cases or scenarios that might take place, and the current prospect that such threats will actually materialize.

CHAPTER 2 - ENDNOTES

1. World Bank, *World Development Indicators, 1998*, Washington: World Bank, p. 14.

CHAPTER 3

NARCOTICS AND ORGANIZED CRIME

Narcotics and organized crime are major problems for the West, but the Middle East is only one region supplying drugs. It is all too apparent that drugs are a global commodity, and that less-developed countries will provide an adequate supply of narcotics as long as developed countries pay for them. The American "war on drugs" has seen a slow, steady decline in the street price of drugs in the United States for roughly a quarter of a century, and all the U.S. political posturing, drug seizures, and efforts to put the blame on exporting countries have so far accomplished nothing. It is unlikely they ever will accomplish anything unless the West can come to grips with the issue of demand.

The Role of the Middle East in Production.

There are serious differences between experts over the scale of narcotics production, export, and use. Some estimates indicate that the world produced slightly under 5,000 tons of opium in 1997, just over 300,000 tons of coca leaf, and about 500,000 tons of marijuana and hashish. Excluding ecstasy, 14.6 tons of amphetamine type stimulants (ATS) were seized in 1996.

Estimates by the United Nations (U.N.) Drug Control Program (UNDCP) indicate, however, that the cultivation of opiates remained constant between 1990 and 1997 at around 266,000 hectares, and that production has increased from 3,830 to 4,861 tons. The key producing countries, in order of production, are Afghanistan, Myanmar, Laos, Thailand, and Pakistan. Columbia and Mexico rank after these countries, but are relatively small producers. No significant producer is located in the Middle East.[1] Europe led the growth in demand. European consumption of heroin,

the key product of opiate production, rose from token levels in 1970, to six tons in 1990, and 10 tons in 1997.[2]

Cocoa production is estimated to have dropped from around 266,000 hectares to 179,200 (43 percent), but production only dropped from 363,981 to 302,523 tons (17 percent). Most of the world's production comes from three Latin American countries: Peru, Columbia, and Venezuela. Small plots exist in Brazil, Guyana, and Venezuela. Production is dropping in Peru and Bolivia, but rising in Columbia. No production takes place in the Middle East. [3] European demand also increased in spite of this trend. European consumption of cocaine rose from token levels in 1970, to 14 tons in 1990, and 39 tons in 1997.[4]

Cannabis production is much better distributed, and estimates of production are very uncertain. It grows wild on some 670,000-1,800,000 hectares, and is cultivated on up to 940,000 hectares. No meaningful trend data are available, but total production seems to be around 500,000 tons. Key locations where cannabis grows wild include Russia, Kazakhstan, and other Central Asian countries. Morocco, Afghanistan, and Pakistan are major cultivators. Lebanon has cultivated hashish, although production has dropped sharply in recent years. Mexico and Columbia are major producers of marijuana, followed by Brazil, Jamaica, and countries in Central America. South Africa, Malawi, Nigeria, and Ghana are major producers of marijuana in Africa. Asian producers of cannabis include Thailand, the Philippines, India, Nepal, and Sri Lanka, with limited production in Papua New Guinea, Fiji, and Western Samoa. The United States, Australia, Canada, and a number of European countries are becoming major producers, using indoor cultivation and advanced hydroponics technology.[5] Although Morocco is a major exporter of hashish, it is not a significant supplier to North America. It exports largely to Europe, where it ranks as the lead supplier, followed by Afghanistan, Pakistan, Kazakhstan, Kyrgystan, and Russia.[6]

The trafficking in ATS is largely local, although there is an international trade in precursors. ATS use is growing sharply, and output has risen from around 1,380 kilograms in 1990 to 14,566 kilograms in 1997. This is an order of magnitude rise in only 7 years. Europe seems to account for about half of the world production and use—virtually all of it in Western Europe—and is a net exporter to other regions, including the Middle East. The United States accounts for around 10 percent. Asia and Australia account for around 44 percent. The Middle East accounts for well under 0.5 percent. The United States and Asia tend to produce methamphetamines, while Europe produces amphetamines and members of the ecstasy group.[7]

The drug trade is so profitable that efforts at control and eradication face almost insuperable barriers. According to Interpol estimates, the global drug trade has grown to the point where the total revenues from illicit drugs amount to approximately $400 billion, or about 8 percent of total global trade. Once again, any such statistics are highly uncertain and controversial. However, this volume of trade in drugs is larger than the volume of global trade in goods iron, motor vehicles, or steel. It is roughly similar to the world textile trade.[8] Illegal drugs cost U.S. society around 67 billion U.S. dollars each year. In the United Kingdom, the annual cost of dealing with the 100,000-200,000 serious drug abusers amounts to well over four billion pounds sterling.[9]

Drugs serve a growing demand-driven market all over the world. Some 200 million people abuse illicit drugs regularly or casually, of which 140 million smoke cannabis, 13 million abuse cocaine, 8 million use heroin, and 30 million use ATS.[10]

Drug trafficking is a key activity of organized crime groups in many different regions of the world. According to Interpol, traffickers obtain the vast majority of drug income—about 90 percent. Farmers make only 6 percent, and processors and traders of raw materials only receive about 2 percent apiece.[11] In the United States and the

United Kingdom, between one-fifth and one-half of illicit drug use is financed by crime, and current trends in money-laundering are towards increasing professionalism and internationalization.[12]

Drugs are a serious transnational threat. Drug abuse has risen steadily over the last two decades and increased sizably since 1990. Significant rises in the number of drug abusers in the developing world have been recorded over the last few years. Drugs represent a genuine and serious threat to Western society and social stability. However, it is South East Asia, South West Asia, and Latin America which dominate the supply side of this transnational threat and not the Middle East.

Table 1 shows the patterns in estimated source drug seizures of 1996, and provides a very rough indication of the volume of the drug trade by area. Only in the case of hashish does the Middle East pose a serious threat to the West with respect to drug production. Heroin seizures in the Middle East accounted for less than 3 percent of global seizures in 1996, and 99.8 percent of cocaine seizures occurred in the Americas and Europe. ATS (amphetamine type stimulants) seizures in Africa, the Near and Middle East and South America accounted for only 1 percent of global seizures.[13]

There also is significant evidence to suggest the Middle East is improving its efforts to fight against drug production and traffic. Syria and Lebanon were recently taken off the list of major drug nations, Iran has strengthened its border controls to halt traffic from Afghanistan. Egypt has introduced new measures to deal with its increasing drug problem at home. The major drug threats come from Afghanistan, Myanmar, and parts of Latin America. Only one Middle Eastern country—Iran—is included in the President's list of 30 major illicit drug producing and transiting countries. U.S. experts privately feel this designation owes more to past political hostility than current conduct.[14]

HEROIN	
Europe	40 percent
South West Asia	24 percent
Africa and Oceania	1 percent
Americas	5 percent
South Asia (India)	5 percent
Middle East	**3 percent**
East and South-East Asia	22 percent
COCAINE	
Americas	89 percent
Europe	10 percent
Rest of World	**less than 1 percent**
CANNABIS	
Americas	69 percent
Europe	11 percent
Africa (inc. Maghreb)	13 percent
Asia and Pacific	7 percent
HASHISH	
Europe	57 percent
Americas	5 percent
Africa	11 percent
Middle East	**25 percent**
Rest of Asia	2 percent
AMPHETAMINE-TYPE STIMULANTS	
Europe	56 percent
East and South-East Asia	31 percent
Australia	2 percent
North America	10 percent
Rest of World	**1 percent**

Table 1.
Patterns in Global Drug Seizures by Area, 1996.

Problems in the Middle East.

Even so, the transnational flow of drugs from and to the Middle East is still a serious problem. While the United States obtains only limited quantities of drugs that originate and transit in the Middle East, Europe's drug problem is fuelled in part by narcotics grown in the Middle East or travelling through the region. Some 75 percent of Europe's hashish comes from Morocco, and 75 percent of its heroin is smuggled or processed through Turkey along the "Balkan Route."

While most Middle Eastern governments have pledged support to international efforts to fight drug trafficking, and have made efforts to curb the practice in the areas under their control, there seem to be three main difficulties with effectively combating the drug problem in the region. These difficulties include:

- Limited facilities and weak institutions,
- Poverty, and
- Internal instability.

Limited Facilities.

The United Nations International Drug Control Program (UNDCP) has a variety of projects underway in the Middle East from Morocco to the Gulf. The emphasis of most UNDCP projects is on the training and basic education of both law enforcement officials and the local populace, and it reflects the fact that Middle Eastern states lack the resources and legal tools they need to deal with the problem.

For example, a UNDCP project has been set up in Algeria to strengthen the training capacities of drug law enforcement institutions, training three officers from the Direction Nationale de la Surete Nationale, the Direction Nationale des Douanes and the Gendarmerie Nationale. Another project funded by Germany and Italy is aimed at

launching an integrated rural development program in the Baalbeck-Hermel region of Lebanon—a part of the country that suffers from considerable poverty where opium cultivation became one of the few means of survival. France has donated some $230,000 to train Tunisian drug law enforcement agencies and provide them with equipment such as radios and land vehicles.[15]

But effective action faces nearly insurmountable difficulties. One of Egypt's problems, for example, is thousands of kilometers of desert borders. Drugs arrive through the neighboring Sudan and Libya, either by jeep or donkey. There is little money to combat the problem, and even government attempts to use radar to detect intruders have proven only partially successful. Under cover of darkness, drug traffickers are able to slip into the desert even if the radar has picked them up.[16]

Lack of equipment and vast desert borders are also a key problem in Jordan—a country making a determined effort to halt the flow of narcotics between its producing and consuming neighbors. Jordanian special forces, for example, deal with Iraqi drug smugglers using heavy weapons and even light armored vehicles. They are fighting an uphill battle, plagued as it is by lack of sufficient manpower and equipment, a situation now exacerbated since foreign assistance has dropped off significantly in recent years.

The United States has dropped Iran from the list of countries which tolerate the production of narcotics, but this does not mean that Iran does not face serious problems. The International Narcotics Control Strategy Report (INCSR) of 1997 acknowledged Iran's interdiction programs are "energetic," but found they were only partially successful at stemming the flow of drugs through the region. Iran has reportedly invested over $250,000,000 in physical barriers (notably barbed wire and fencing) on the roads and mountain passes of its eastern frontier, particularly on the border with Pakistan. It, too, is forced to fight drug

smugglers with heavy weapons and sometimes with armored vehicles left over from the Afghan conflict. Iran states it has made drug seizures of over 190 tons and has sacrificed the lives of 2,000 members of its law enforcement forces in trying to combat the problem over the last decade. Pakistani incapacity and Afghan Taliban unwillingness to fully cooperate on border control measures, however, have meant that Iran's efforts are only very partially effective. Large shipments of opium continue to transit Iran.

Another major facet of the problem is the ineffectiveness of many laws that govern drug trafficking and (most notably in the case of Israel) money-laundering. For example, the Anti-Narcotics General Administration (AGA), Egypt's counternarcotics security apparatus, does not even have access to basic enforcement authority such as access to the tarmac at the airport.[17] The INCSR, 1996, points the blame for the repeated failures of the Egyptian government to effectively tackle its drug problem at the lack of cooperation between its various law enforcement agencies.

Morocco has similar problems. UCLAD, the government's coordination unit for the struggle against drugs, was created in 1996 as part of the Ministry of the Interior to coordinate antidrug efforts. A vicious circle seems to have developed: European diplomats have reported the general inefficiency of the operation, believing it lacks the resources to fulfill its mandate. Subsequently the EU will continue to withhold funds until it knows they will be put to constructive use.[18]

Ineffective or nonexistent laws relating to money-laundering, and strict bank secrecy laws as exist in Israel, are another source of difficulties. There are clear financial advantages to be gleaned from such regulations but always at the cost of providing a potential safe haven for criminal funds. Lebanon, for example, when it acceded to the 1988 U.N. Drug Convention, registered formal reservations regarding some of the provisions. One of these was bank secrecy.

Since then, the U.S. Government, at the request of the Lebanese government, has been providing technical expertise to the authorities to strengthen provisions in the law dealing with money-laundering and bank secrecy. Israel, neither a significant drug producer nor trafficker, plays its part in the narcotics trade nevertheless by its strict bank secrecy regulations and its absence of money-laundering laws. It is assumed that considerable amounts of drug money and individuals involved in drug dealing pass through Israel for these reasons.[19] That Israeli citizens were immune from extradition only compounded the problem.

Poverty.

In the West there is a close connection between the poor and drug abuse. In the Middle East a connection exists between the poor and drug production. The Bekaa Valley in Lebanon and the Bedu-controlled areas of the Sinai are examples of regions that turned to opium production in the absence of any viable alternative. For example, Egyptian police burned hundreds of hectares of poppy fields in the Sinai Peninsula, where Bedouin tribes operate far from central authority, in March of 1995. The Anti-Narcotics General Administration said that the sweep had cost the Bedu around $US62 million in lost revenue. [20]

Poverty of the state clearly has a huge effect on its ability (or desire) to combat illicit drug trafficking. There is evidence to suggest that King Hassan's approach to the eradication of cannabis plantations in the Rif mountains and in Northern Morocco has been similar to that of Alberto Fujimori of Peru. Fujimori refused to destroy the coca leaf plantations until a productive alternative had been found.

The Geopolitical Drugs Observatory (independent) in Paris alleges that hashish trafficking is now Morocco's biggest single source of export income, providing Europe with 75 percent of total imports. Morocco's poor farmers have little reason to give up farming such a crop and the Moroccan government already faces serious internal

political problems. The UNDCP program dealing with the Bekaa in Lebanon attempts to shift farming away from drugs, but it is unclear there is any crop of equal value. Lebanon's previous lack of money-laundering laws also provided the country with a much needed way of attracting money.

Governments in the Middle East have often felt that the control of narcotic trafficking was less important to the welfare of the state than other concerns. In the past, the Islamic Republic of Iran has focused more attention on illegal alcohol use than on drug consumption. In Israel, budgetary allocations to fight drugs have been frozen or falling as the Israeli government tries to reduce its budget deficit. The Arab Republic of Egypt is forced to expend the majority of its security resources on combating terrorism instead of narcotics. Lebanon simply does not have the military resources to storm the opium ridden areas in the mountains.

Internal Instability.

Ironically, the Algerian civil war has been so bitter that it has limited the scale of the nation's narcotics problem. Other countries have not been so lucky. The Bekaa Valley, for example, has long been a Hezbollah stronghold and an area over which the Lebanese government exercised only nominal control. It took the military power of Syria to limit Hezbollah operations in the area. Syria then found, however, that it could not exercise control over its own officials—who enjoyed much greater autonomy of action outside the country and were freer to develop illegal business ventures. It also soon found that sectarian and national differences give way to money. Syrian officials tolerate Maronite Christian dealers working with Shi'ite growers.[21]

In other cases, nations may find it desirable to make an opposition movement the scapegoat. Turkey persistently reports the involvement of the Kurdistan Workers' Party

(PKK) in narcotics trafficking through the country. [22] The PKK, a terrorist, ethnic separatist group based in the predominantly Kurdish border region between Turkey, Iran, and Iraq, allegedly uses "taxes" extracted from narcotics traffickers and refiners to finance its operations. It may also be directly involved in transporting and marketing narcotics in Europe. At the same time, a traffic accident in 1996 created the "Susurluk" incident in Turkey, and exposed the fact that high-level officials in the Turkish security structure are also in league with drug kingpins.

Middle Eastern Successes.

The West needs to acknowledge that the Middle East has had some important recent successes in the fight against drug trafficking. Israel has been steadily more successful in arresting traffickers, Lebanon and Syria were taken off the Majors List for drug trafficking or producing countries in November 1997. Turkey now produces far fewer illicit drugs. A great deal has been achieved, much through increased cooperation between neighboring states and much through greater willingness on the part of Middle Eastern governments to address the problem of narcotics trafficking.

Successes can be seen in three areas—reduced production, reduced transit, and reduced corruption. Some successes seem to have occurred in nations which the West sees as a source of other transnational threats. In 1994, Interior Minister Besharati said that Iran had spent $8 billion on fighting drug-related activities since the 1979 revolution—although Iran later reduced this figure to $2 billion.[23] In September 1997, Iran's President Khatami's statement to the Interpol Counter-Drug Conference in Teheran indicated that Iran was taking a more active role in regional counternarcotics operations. Iran also reported that it had recently invested $250,000,000 in physical barriers on the roads and mountain passes of its eastern frontier. It stated that its recent interdiction efforts have

resulted in drug seizures reported to be over 190 tons. It claimed that it had executed over 10,000 narcotics traffickers in the last decade.

There is independent evidence to support these Iranian claims. In 1993, a declassified U.S. Government survey of Iranian poppy cultivation estimated that 3,500 hectares were under cultivation in Iran, producing between 35 and 70 metric tons of opium. This year, observers that included members of the Dublin Group supported Iranian claims that much of the opium crop had been eradicated. It is Iran's lack of any firm bilateral agreements with Pakistan or Afghanistan which now constricts Iran's efforts to control smuggling across the border.

Lebanon was removed from the list of major drug-producing and drug transit countries in November 1997. The Lebanese government claims that a combination of Lebanese and Syrian efforts eradicated all but 150 of the 3,400 hectares of opium between 1992 and 1996, Lebanon may be exaggerating its success, and has certainly met with less success in combating drug transit and money-laundering, but it has taken several steps forward.

Turkish law enforcement agencies are increasing their activity, although there are still problems with internal corruption. Turkey reports a total of 3,634 drug-related arrests in 1997. A "Financial Crimes Investigation Board" was set up by the Ministry of Finance last year to conduct studies for the prevention of money-laundering. The creation of this board follows the passage of anti-money-laundering legislation which finally criminalizes the laundering of proceeds of narcotics trafficking and other criminal activities, and includes provisions for controlled delivery and asset seizure.

Syria's difficulties with corrupt military officials working in the Bekaa Valley have been reduced. Syria now cooperates much more closely with Lebanese authorities in the areas of interdiction, cultivation and production. In 1997, Syria also cooperated with Jordan. The exception was

cooperation with Turkey, because of problems in other areas, notably arguments over water consumption from the Euphrates, the Kurdish question, Antalya, and Turkey's mutual aid agreement with Israel. Turkey did, however, help Syria in the break-up of a major amphetamine smuggling operation in September and October 1997. This operation led to the arrests of 27 people and the confiscation of more than 800,000 pills and 139 kilograms of amphetamine in powder form.

Jordan has very limited resources, but has improved its anti-trafficking record by maintaining close links with neighboring countries—including Saudi Arabia, Syria, Egypt, and Israel. It is currently attempting to improve cooperation with Turkey in counternarcotics matters. Jordan has added 40 officers to its antinarcotics department, despite a chronic lack of resources. Jordan is also fighting a low-level war with Iraqi smugglers on its border with Iraq, some of which attempt to bring in drugs that have transited through Iraq from Afghanistan and Turkey and which then generally are smuggled into the Southern Gulf states.[24]

Jordan, however, is also a warning that Europe, the United States, and the U.N. need to continue to help the Middle East combat its drug problem, and must not ignore the "balloon effect" that occurs when crop eradication is performed successfully in one area and cultivation is simply moved somewhere else. Jordan, for example, faced a serious resurgence in trafficking when foreign aid to combat trafficking dropped off after crop eradication in Lebanon.[25]

The "problem child" in the region is Morocco, which now supplies Europe with up to 75 percent of its hashish. The independent Geopolitical Drugs Observatory in Paris states that cannabis production in Morocco has increased tenfold in the last 10 years, and involved some 200,000 workers in an area covering between 64,000 and 74,000 hectares in 1995. *Le Monde* published a front-page article before King Hassan II's visit to Paris in July 1995, alleging that

traffickers were protected at all levels of society, ranging from customs officials to the highest levels of the royal palace. As a result, King Hassan called off his visit.[26]

Internal Needs versus Concern for the West.

These Middle Eastern efforts to deal with drug problem are not motivated by an altruistic concern for transnational threats to the West, and probably owe little to any fear of Western publicity and sanctions. The key motivation is the fact that the flow of drug exports almost inevitably leads to increased demand at home. A growing proportion of the drug traffic in the Middle East is intended for consumption in the area itself.

Middle Eastern countries have always had drug users, but most Islamic and Arab countries had only moderate drug use because of the social stigma associated with substance abuse. Alcohol is forbidden by the Qur'an. While drugs are not specifically referred to, they, too, have traditionally been perceived as *haram*. Even so, drug abuse has increased dramatically in every Middle Eastern country (except perhaps Syria) in the last few years.[27]

Egypt is a good example. It has not been a significant producer or trafficker on the international scene, but it is experiencing growing problems and is now a heroin producing and using country. Traditional opium addiction has not increased over the last few years, but opium cultivation has increased considerably in the Sinai. This opium seems to be going to produce heroin destined for the home market.

The number of estimated addicts in Israel has grown to 20,000. Drug use is on the rise in Jordan with government officials estimating there to be approximately 30,000 users. In 1996, Iran stated that the number of addicts was 500,000. Unofficial estimates run as high as 2,000,000—more than the number of "habitual" users in France.

Ironically, there is also a substantial flow of drugs from the West to the Middle East. The U.S. State Department's annual report on drugs indicates that Turkey is the primary stopover and consolidation point on the "Balkan Route," and is a center of trafficking *to* the Middle East. Most of the illicit drugs that transit Jordan originate in Lebanon and Turkey and enter Jordan from Syria. Once in Jordan, the drugs are stored before being transported to other areas in the region, primarily Egypt, Israel, and Saudi Arabia. According to the Jordanian government, traffic to Europe is minimal and to the United States almost nonexistent.[28]

Morocco seems to be the only country in the region which has failed to take serious account of its domestic drug problem, although estimates of the domestic use of the cannabis crop range from 15 to 40 percent of the Moroccan crop. Once again, however, the Moroccan government gains from turning a blind eye. A substantial part of this domestic use is smoked by foreigners who go to Morocco specifically for that purpose. This boosts tourism and hard currency income, and cannabis abuse is seen as a traditional and relatively harmless affair.

Transnational Cooperation between Middle Eastern and Western Criminals.

Middle Eastern and Western criminals cooperate to create a transnational threat to both regions. Most Middle Eastern countries are party to most U.N. anti-narcotic conventions, including the 1988 U.N. Convention, the 1961 U.N. Single Convention on Narcotic Drugs and its 1972 Protocol, and the 1971 Convention on Psychotropic Substances. However, regional legal systems still differ sharply, and smuggling across borders remains difficult to control.

For example, differences in law can make legal snakepits out of capture or extradition. Drug traffickers exploit such loopholes as the differences between national financial legislation in matters of money-laundering. Israel,

where extradition of a citizen has been illegal since 1978, is a case in point. Though some provisions for crimes committed by an Israeli national abroad do exist, extradition legislation is vital to ensure that drug traffickers be duly punished. Such a law should soon come into effect. Pino Arlacchi, Executive Director of the UNDCP has warned that, "Drug traffickers are thinking globally—so should we."[29]

It is generally the Western criminals that end up with most of the money. According to Interpol, the key traffickers worldwide are organizations like the Cosa Nostra based in Sicily and New York, new Mafia groups based in Russia and other Eastern European countries, some far Eastern groups like the Triads and the Yakuza, and the cocaine cartels of Mexico and Colombia. As yet, no important Arab or Islamic Mafia group has been discovered. European criminals dominate the drug trade with the Middle East and get most of the money. The greatest traffickers in Europe are purportedly Eastern Europeans, with Turks heading the list along with ex-Yugoslavians, Slovaks, Romanians, Bulgarians, and Albanians. Spain receives the greatest shipments of cocaine destined for Europe, in quantities considerably bigger than any Middle Eastern country.

In any case, drug imports are only part of the West's problem. While the number of heroin addicts in Europe does remain frighteningly high (100,000 addicts estimated in Britain alone), there is a growing interest, especially amongst the young, in locally-made designer drugs such as ecstasy.[30] Up to 30 million people regularly or casually abuse ATS, compared to only 13 million abusers of cocaine and 8 million of heroin.[31] ATS is the fastest growing drug in Europe, but no ATS are manufactured in the Middle East. The production process is simply too complicated. European countries—Germany, the Netherlands, and Great Britain—produce ATS.

Cooperation, Not Conflict.

The Middle East is not the source of the West's supply problem, and only reductions in demand can really end the drug problem. There is, however, a clear case for cooperation, and both the West and Middle East have a clear motive. From a Western viewpoint, there is far more to be gained from patient legal efforts, cooperation between enforcement agencies, and aid to Middle Eastern enforcement efforts than from finger pointing, or Western attempts to blame the problem on someone else.

At the same time, there is no room for illusions. Drug demand is so high, and the financial rewards are so great, that drug trafficking has defeated virtually every effort at enforcement. Massive seizures and arrests have almost no impact on the market. Law enforcement reporting that quotes the street value of drugs is little more than a dishonest exercise in publicity-seeking and self-justification. Producers and distributors do not pay street prices and major traffickers see losses due to law enforcement as a normal and easily affordable business risk. The U.S. "War on Drugs," for example, borders on farce. It shifted the pattern of production and distribution in Latin America, but had no impact on the realities of the market. Retail and wholesale prices in constant dollars continue to drop, and the scale of international distribution and availability continues to increase.

The issue of which region corrupts which other region is virtually moot; drugs are a global commodity. Eradication and production control programs cannot have lasting success unless nations experience sustained economic growth and drug production ceases to be competitive with other groups. Even if this happens in one area or country, the end result may simply be to shift production to other countries or regions. The marginal cost of producing artificial drugs is low, and improved cultivation techniques are shifting the "agriculture" of drugs like marijuana to industrialized states like Canada and the United States.

Supply side controls and law enforcement can only act as deterrents, and place very uncertain limits on this transnational threat. It ultimately can only be solved by social measures that affect demand, and no Western society has yet demonstrated that such measures can either eliminate a large core of addicts or remove drug-related crime.

CHAPTER 3 - ENDNOTES

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CHAPTER 4

IMMIGRATION

Immigration is a fact of modern economic life. Although it may create political and economic problems for the labor importing state, the flow of labor migration also serves the needs of the host economy and is not a "transnational" threat. The overall process of immigration is also driven as much by demand as by supply. If Western governments truly wanted to block immigration and deport illegal immigrants, they could do so. Similarly, most of the social problems that result from immigration seem to be failures on the part of individual Western nations to deal with the economic realities of their dependence on immigration and to establish sound labor and immigration policies on their own soil.

The overall patterns in immigration to the West are shown in Table 2. These data do not support meaningful assessments of the number of immigrants coming from the Middle East and North Africa. The supporting data indicate, however, that most Western countries absorb immigrants from a diverse mix of regions, and that the Balkans, Southern Europe, South Asia, and Turkey are as important a factor as the Middle East. The foreign population of the Netherlands, for example, is 19.8 percent from the richest OECD countries, 15.4 percent from Turkey, 14.6 percent from Surinam, 12.8 from the former Dutch East Indies, 12.7 percent from Morocco, 4 percent from the Antilles and Aruba, and 20.7 percent other. The exceptions are France and Italy, which have a major flow of immigration from North Africa.[1]

The CIA estimates of religious and ethnic composition by country shown in Table 3 also do not raise major concerns about the impact of immigration on the West in gross demographic terms. To date, the net impact of immigration

Country	Foreign Population				Labor Force as% of Total		Total Foreign Inflow (1,000s)		Asylum Seekers (1,000s)	
	1990		1995							
	No (1,000s)	.% Total Pop	No. (1,000s)	% Total Pop	1990	1995	1990	1995	1990	1995
Australia	4,125*	22.7	-	-	25.8*	24.0*	121	99	4	5
Austria	456	5.9	724	9.0	-	10.2	-	-	23	6
Belgium	905	9.1	910	9.0	7.5	8.1	51	53	13	12
Canada	4,343*	15.6	-	-	18.4*	18.5*	214	212	37	26
Denmark	161	3.1	223	4.2	2.0	2.8	15	16	5	5
Finland	26	0.5	69	1.3	-	-	7	7	3	1
France	3,597	6.3	-	-	6.4	6.2	102	57	47	20
Germany	5,343	8.4	7,174	8.8	8.4	7.4	842	788	193	128
Ireland	80	2.3	96	2.7	2.6	3.0	-	-	-	-
Italy	781	1.4	991	1.7	-	1.9	-	-	5	2
Japan	1,075	0.9	1,362	1.1	-	0.9	224	210	-	-
Luxembourg	113	29.4	138	33.4	33.4	56.2	9	10	-	-
Netherlands	692	4.6	728	5.0	3.7	4.0	81	67	21	29
Norway	143	3.4	161	3.7	-	4.5	16	17	4	2
Portugal	108	1.1	168	1.7	-	1.7	-	-	0	1
Spain	279	0.7	500	1.2	-	0.6	-	-	9	6
Sweden	484	5.6	532	5.2	5.6	5.1	53	36	29	9
Switzerland	1,100	16.3	1,331	18.9	-	19.4	101	88	36	17
UK	1,723	3.2	2,060	3.4	3.5	3.6	52	56	38	55
US	19,767*	7.9	24,557	9.3	9.4*	9.3*	1,537	721	74	149

* Foreign born

Source: Adapted by Anthony H. Cordesman from World Bank, *World Development Indicators, 1998*, Washington, World Bank, 1998, pp. 345-355.

Table 2.
Foreign Labor and Population in the West.

Austria

Ethnic groups: German 99.4%, Croatian 0.3%, Slovene 0.2%, other 0.1%

Religions: Roman Catholic 85%, Protestant 6%, other 9%

Belgium

Ethnic groups: Fleming 55%, Walloon 33%, mixed or other 12%

Religions: Roman Catholic 75%, Protestant or other 25%

Languages: Flemish 56%, French 32%, German 1%, legally bilingual 11%

Canada

Ethnic groups: British Isles origin 40%, French origin 27%, other European 20%, Amerindian 1.5%, other, mostly Asian 11.5%

Religions: Roman Catholic 45%, United Church 12%, Anglican 8%, other 35%

Denmark

Ethnic groups: Scandinavian, Eskimo, Faroese, German

Religions: Evangelical Lutheran 91%, other Protestant and Roman Catholic 2%, other 7% (1988)

Languages: Danish, Faroese, Greenlandic (an Eskimo dialect), German (small minority)

France

Ethnic groups: Celtic and Latin with Teutonic, Slavic, North African, Indochinese, Basque minorities

Religions: Roman Catholic 90%, Protestant 2%, Jewish 1%, Muslim (North African workers) 1%, unaffiliated 6%

Languages: French 100%, rapidly declining regional dialects and languages (Provencal, Breton, Alsatian, Corsican, Catalan, Basque, Flemish)

Germany

Ethnic groups: German 91.5%, Turkish 2.4%, Italians 0.7%, Greeks 0.4%, Poles 0.4%, other 4.6% (made up largely of people fleeing the war in the former Yugoslavia)

Religions: Protestant 38%, Roman Catholic 34%, Muslim 1.7%, unaffiliated or other 26.3%

Languages: German

Greece

Ethnic groups: Greek 98%, other 2%; note: the Greek Government states there are no ethnic divisions in Greece

Religions: Greek Orthodox 98%, Muslim 1.3%, other 0.7%

Languages: Greek (official), English, French

Table 3.
Ethnic and Religious Composition of Western States.

Ireland

Ethnic groups: Celtic, English

Religions: Roman Catholic 93%, Anglican 3%, none 1%, unknown 2%, other 1% (1981)

Languages: Irish (Gaelic), spoken mainly in areas located along the western seaboard, English is the language generally used

Italy

Ethnic groups: Italian (includes small clusters of German-, French-, and Slovene-Italians in the north and Albanian-Italians and Greek-Italians in the south)

Religions: Roman Catholic 98%, other 2%

Languages: Italian, German (parts of Trentino-Alto Adige region are predominantly German speaking), French (small French-speaking minority in Valle d'Aosta region), Slovene (Slovene-speaking minority in the Trieste-Gorizia area)

Luxembourg

Ethnic groups: Celtic base (with French and German blend), Portuguese, Italian, and European (guest and worker residents)

Religions: Roman Catholic 97%, Protestant and Jewish 3%

Languages: Luxembourgish, German, French, English

Netherlands

Ethnic groups: Dutch 96%, Moroccans, Turks, and other 4% (1988)

Religions: Roman Catholic 34%, Protestant 25%, Muslim 3%, other 2%, unaffiliated 36% (1991)

Languages: Dutch

Norway

Ethnic groups: Germanic (Nordic, Alpine, Baltic), Lapps (Sami) 20,000

Religions: Evangelical Lutheran 87.8% (state church), other Protestant and Roman Catholic 3.8%, none 3.2%, unknown 5.2% (1980)

Languages: Norwegian (official); note: small Lapp- and Finnish-speaking minorities

Portugal

Ethnic groups: homogeneous Mediterranean stock in mainland, Azores, Madeira Islands; citizens of black African descent who immigrated to mainland during decolonization number less than 100,000

Religions: Roman Catholic 97%, Protestant denominations 1%, other 2%

Languages: Portuguese

Table 3.
Ethnic and Religious Composition of Western States. (Continued)

Spain

Ethnic groups: composite of Mediterranean and Nordic types

Religions: Roman Catholic 99%, other 1%

Languages: Castilian Spanish 74%, Catalan 17%, Galician 7%, Basque 2%

Sweden

Ethnic groups: white, Lapp (Sami), foreign-born or first-generation immigrants 12% (Finns, Yugoslavs, Danes, Norwegians, Greeks, Turks)

Religions: Evangelical Lutheran 94%, Roman Catholic 1.5%, Pentecostal 1%, other 3.5% (1987)

Languages: Swedish; note: small Lapp- and Finnish-speaking minorities

Switzerland

Ethnic groups: total population - German 65%, French 18%, Italian 10%, Romansch 1%, other 6%; note: Swiss nationals - German 74%, French 20%, Italian 4%, Romansch 1%, other 1%

Religions: Roman Catholic 46.7%, Protestant 40%, other 5%, no religion 8.3% (1990)

Languages: German 63.7%, French 19.2%, Italian 7.6%, Romansch 0.6%, other 8.9%

Turkey

Ethnic groups: Turkish 80%, Kurdish 20%

Religions: Muslim 99.8% (mostly Sunni), other 0.2% (Christian and Jews)

Languages: Turkish (official), Kurdish, Arabic

United Kingdom

Ethnic groups: English 81.5%, Scottish 9.6%, Irish 2.4%, Welsh 1.9%, Ulster 1.8%, West Indian, Indian, Pakistani, and other 2.8%

Religions: Anglican 27 million, Roman Catholic 9 million, Muslim 1 million, Presbyterian 800,000, Methodist 760,000, Sikh 400,000, Hindu 350,000, Jewish 300,000 (1991 est.); note: the UK does not include a question on religion in its census

Languages: English, Welsh (about 26% of the population of Wales), Scottish form of Gaelic (about 60,000 in Scotland)

United States

Ethnic groups: white 83.4%, black 12.4%, Asian 3.3%, Amerindian 0.8%

Religions: Protestant 56%, Roman Catholic 28%, Jewish 2%, other 4%, none 10%

Languages: English, Spanish (spoken by a sizable minority)

Source: CIA, *World Factbook, 1997*.

Table 3.
Ethnic and Religious Composition of Western States. (Concluded)

from the Middle East is also minor by Australian, Canadian, and U.S. standards. It may create problems in given cities or areas, but the problem is greater for Europe than for the Middle East.

Europe and Immigration from the Middle East.

The scale of the problem Europe faces is shown in Table 4. It is clear from Part One of Table 4 that foreigners from the entire Mediterranean area are still only a small fraction of the total foreign population in European countries, and that non-Middle Eastern states like Turkey, Cyprus, and Malta account for well over half of all the foreign population from the Mediterranean region. Belgium and France are the only European countries where there is a large Arab population, although the Netherlands is beginning to acquire a relatively large number of Moroccans. There is no European country where Middle Easterners make up even 3 percent of the population, and no European country in which they make up even 10 percent of the total foreign residents. Parts Two and Three of Table 4 also show that there continues to be a substantial outflow of foreign residents, although data are lacking on foreign residents leaving key countries like France.

If these patterns continue, any threat from "immigration" would be more one of perception than reality. However, perceptions are important. Peoples do not perceive the impact of immigration in terms of demographic statistics. They perceive it in terms of the presence of different cultures, usually with lower incomes, higher crime rates, and a willingness to work at lower salaries. Social customs and religion are also important issues. Some estimates indicate that 5 percent of France's total population, or three million people, is Muslim.[2] Other estimates indicate that Moroccans make up the most important community of foreign residents in both Italy (20.6 percent) and Spain (15.5 percent).[3] There are about seven

	Total Population	Foreign Population			Mediterranean Population in Europe					
		Number	% of Total	Total	Cyprus	Malta	Turkey	Algeria	Egypt	Morocco
EU-15	369,394,216	17,562,792	28	4,842,748	21,814	10,262	2,668,690	652,810	41,521	1,034,331
Belgium	10,134,574	922,338	27	249,841	-	-	85,891	10,001	-	143,969
Denmark	5,215,718	196,705	23	45,939	29	15	34,967	394	520	3,227
Germany	81,538,600	6,990,510	32	2,204,044	1,139	313	1,965,577	19,085	13,370	84,412
Greece	10,442,863	152,834	12	18,516	138	52	3,108	189	7,054	369
Spain	39,169,639	460,766	16	71,644	-	23	315	3,201	667	63,939
France	56,651,955	3,596,602	4.5	1,627,213	-	-	197,712	614,207	6,341	57,262
Ireland	3,598,400	96,400	-	-	-	-	-	-	-	-
Italy	57,268,600	683,564	1.0	4,729	296	700	3,733	-	-	-
Luxembourg	406,600	132,500	-	-	-	-	-	-	-	-
Netherlands	15,424,122	757,138	4.7	353,430	51	100	182,089	933	4,548	158,653
Portugal	9,912,100	157,073	151	-	2	3	65	-	-	-
Finland	5,098,754	62,012	5.0	2,881	24	6	1,178	222	197	597
Sweden	8,816,381	537,441	7.0	38,931	135	50	21,995	578	824	1,513
UK	57,680,000	2,096,000	4.0	83,000	20,000	9,000	29,000	4,000	8,000`	7,000

Table 4. Foreign and Middle Eastern Population in Europe - Part One: Total Population.

	Metiterranean Population in Europe (cont'd)						ME as %
	Tunisia	Israel	Jordan	Lebanon	Palestine	Syria	of Total
EU-15	244,971	21,657	16,540	95,251	179	34,772	1.31
Belgium	5,714	1,985	290	1,901	-	-	2.47
Denmark	452	583	760	4,402	-	589	0.88
Germany	27,539	9,693	12,517	54,269	-	18,310	2.70
Greece	327	624	1,394	2,890	26	2,345	0.18
Spain	394	323	609	1,102	153	918	0.18
France	206,336	2,908	-	20,953	-	6,104	2.87
Ireland	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	0.01
Luxembourg	-	-	-	-	-	-	-
Netherlands	2,124	1,501	320	985	-	2,126	2.29
Portugal	-	81	-	-	-	-	-
Finland	149	216	109	109	-	74	0.06
Sweden	1,116	743	541	6,640	-	4,256	0.44
UK	1,000	3,000	-	2,000	-	-	0.14

Table 4. Foreign and Middle Eastern Population in Europe - Part One: Total Population (Concluded).

1995	Total Immigrants 1986-95	Total Immigrants	Foreign Immigrants	Total	Mediterranean Immigrants to Europe					
					Cyprus	Malta	Turkey	Algeria	Egypt	Morocco
EU-15 86-95	18,821,531	-	13,106,375	1,766,722	2,810	1,589	967,404	116,170	55,989	352,992
EU-15	-	1,883,269	1,308,197	152,254	742	418	90,944	11,513	5,495	25,197
Belgium	524,946	62,950	53,138	7,168	-	-	2,520	429	-	3,595
Denmark	427,877	63,187	39,145	1,518	1	-	990	33	73	145
Germany	11,447,942	1,096,048	792,701	90,911	-	-	74,517	2,990	1,608	3,790
Greece	306,440	20,859	20,859	2,872	10	7	229	22	1,755	64
Spain	289,650	36,092	19,538	4,352	-	-	24	334	46	3,846
France	679,469	50,387	50,387	19,370	6	-	3,072	7,102	210	6,286
Ireland	38,400	-	-	-	-	-	-	-	-	-
Italy	961,460	100,788	53,418	6,047	-	-	-	181	726	4,112
Luxembourg	20,355	10,325	9,590	112	-	1	25	12	-	49
Netherlands	1,035,395	96,099	66,972	9,378	10	5	4,757	332	494	3,100
Austria	-	-	-	-	-	-	-	-	-	-
Portugal	34,265	5,025	5,025	28	-	-	9	5	1	8
Finland	125,749	12,222	7,345	298	3	2	148	22	20	46
Sweden	545,595	45,887	36,079	1,800	12	3	853	51	62	155
UK	2,383,988	245,000	154,000	8,400	700	400	3,800	-	500	-

Table 4. Foreign and Middle Eastern Population in Europe - Part Two: Immigrants.

	Mediterranean Population in Europe (Continued)							
	Tunisia	Israel	Jordan	Lebanon	Palestine	Syria	ME as % of Total Immigrants	Med as % of Total Foreign
EU-15 86-95	89,315	30,464	12,933	110,765	1,272	25,019	9.4	13.5
EU-15	5,683	3,070	2,509	3,744	-	2,939	8.0	12.0
Belgium	278	218	-	127	-	-	11.0	13.0
Denmark	24	63	19	122	-	48	2.0	4.0
Germany	2,143	825	838	2,300	-	1,900	8.0	11.0
Greece	46	69	135	200	-	344	14.0	14.0
Spain	18	11	9	29	-	35	12.0	22.0
France	1,862	135	-	572	-	125	-	38.0
Ireland	-	-	-	-	-	-	-	-
Italy	1,028	-	-	-	-	-	6.0	11.0
Luxembourg	25	-	-	-	-	-	1.0	1.0
Netherlands	173	194	37	99	-	177	10.0	14.0
Austria	-	-	-	-	-	-	-	-
Portugal	2	1	1	1	-	-	1.0	1.0
Finland	14	17	10	11	-	5	2.0	4.0
Sweden	70	46	60	183	-	305	4.0	5.0
UK	-	1,500	1,400	100	-	-	3.0	5.0

Source: Adapted by Anthony H. Cordesman from Eurostat, *Statistiques en Bref: Population and Conditions Sociales*, 1998/3, ISSN 1024-4360, March 23, 1998.

Table 4. Foreign and Middle Eastern Population in Europe - Part Two: Immigrants (Concluded).

	Total Emigrants 1986-95	1995								
		Total Emigrants	Foreign Emigrants	Mediterranean Emigrants from Europe						
				Total	Cyprus	Malta	Turkey	Algeria	Egypt	Morocco
EU-15 86-95	10,495,519	-	6,734,185	634,069	5,419	298	472,580	13,589	14,871	42,200
EU-15	-	1,162,937	723,001	67,878	223	7	47,671	3,389	2,943	4,666
Belgium	396,576	36,044	21,598	1,018	-	-	373	70	-	336
Denmark	326,155	34,630	11,109	643	3	1	335	4	55	55
Germany	5,986,099	698,113	567,441	59,186	-	-	44,366	3,270	1,933	2,907
Greece	-	-	-	-	-	-	-	-	-	-
Spain	352	-	-	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-	-	-	-
Ireland	32,800	-	-	-	-	-	-	-	-	-
Italy	617,976	50,120	5,313	354	-	-	-	11	38	223
Luxembourg	11,827	4,940	28	-	-	6	8	-	7	7
Netherlands	571,854	63,321	21,673	3,089	3	4	1,581	12	75	1,200
Austria	-	-	-	-	-	-	-	-	-	-
Portugal	59,370	6,901	-	-	-	-	-	-	-	-
Finland	75,115	8,957	1,516	48	3	-	11	2	5	7
Sweden	260,299	33,983	15,411	512	14	2	199	12	37	31
UK	2,157,096	192,000	74,000	3,000	200	-	800	-	800	-

Table 4. Foreign and Middle Eastern Population in Europe - Part Three: Emigrants.

	Mediterranean Emigrants from Europe (Continued)						ME as % of Total Emigrants	Med as % of Total Departures
	Tunisia	Israel	Jordan	Lebanon	Palestine	Syria		
EU-15 86-95	22,066	16,322	7,577	33,139	7	6,001	6.0	9.4
EU-15	2,363	1,849	1,160	2 ,738	-	869	6.0	9.0
Belgium	96	95	-	48	-	-	3.0	5.0
Denmark	17	53	24	83	-	13	2.0	6.0
Germany	1,949	823	711	2,503	-	824	8.0	10.0
Greece	-	-	-	-	-	-	-	-
Spain	-	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-
Italy	82	-	-	-	-	-	1.0	7.0
Luxembourg	-	-	-	-	-	-	0.0	1.0
Netherlands	71	97	9	21	-	16	5.0	14.0
Austria	-	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-	-
Finland	1	17	1	1	-	-	1.0	3.0
Sweden	40	64	15	82	-	16	2.0	3.0
UK	100	700	400	-	-	-	2.0	4.0

Source: Adapted by Anthony H. Cordesman from Eurostat, *Statistiques en Bref: Population and Conditions Sociales*, 1998/3, ISSN 1024-4360, March 23, 1998.

Table 4. Foreign and Middle Eastern Population in Europe - Part Three: Emigrants (Concluded).

million “foreigners” in Germany, including over one million born in Germany, and around two million are Muslims.[4]

This raises a question of definitions. The United States normally does not include Turkey in the Middle East. It is a member of NATO, it is not Arab, and its economy is closely linked to Europe. Some Germans however, do include Turkey in the Middle East, particularly ordinary German citizens and Germans who oppose immigration from any different culture. If Turkey is included in the totals for foreign residents of Germany, it changes the statistics. Data from the German statistics office on Germany’s population in 1998 indicate that there are currently about 7.4 million foreigners in Germany, out of a total population of 84 million, or about 8.8 percent. About 2,107,000 foreign residents were Turkish, followed by 721,000 from Yugoslavia, 608,000 from Italy, 363,000 from Greece, 283,000 from Bosnia, 207,000 from Croatia, 185,000 from Austria, 132,000 from Portugal, 132,000 from Spain, 114,000 from Iran, 113,000 from the Netherlands, 112,000 from Britain, 110,000 from the United States, 104,000 from France, 88,000 from Vietnam, 84,000 from Morocco, 66,000 from Afghanistan, 60,000 from Sri Lanka, 56,000 from Lebanon, and 1,440 from other countries.

Using these numbers, only about 254,000 residents are Arab, Iranian, or Israeli (0.3 percent). If the Turks were added, however, the percentage would rise to 2.8 percent. This highlights the perceptual problem of trying to separate real immigrants from the Middle East from anyone else with a different religion, culture, and skin color. This is as much of a problem in Europe as in the United States, but is scarcely a “transnational threat.”

If there is a real potential “transnational threat” to Europe, it consists of sudden new flows of illegal immigration or of massive flows of people fleeing political oppression or conflict. Political conflicts can and have created massive flows of population. The United Nations estimates that there are currently 22.7 million refugees and

displaced persons worldwide.[5] This kind of mass immigration of refugees could present the West with two kinds difficulties:

- The first is created by the flow of political refugees or immigrants who become politically active in their new host state. Examples include Iranian opposition members who go to Europe and the United States. This problem is comparatively minor.

- The second is a massive flow of refugees fleeing their home country. This could lead to hugh increases in both legal and illegal immigration. Once again, the primary threat is the sudden flow of population from a Maghreb country like Algeria to Southern Europe.

Table 4 shows that Maghreb, in particular, could present problems for Europe. Economic progress is limited and access to Southern Europe is relatively easy. Many Moroccans, Algerians, and Tunisians would emigrate to Europe if given the chance, and one press report indicates that a survey of young men in Morocco showed that up to 70 percent wanted to immigrate to find better jobs.

A number of European countries already have significant numbers of political activists who see their refugee population as a financial burden to them and a threat to their cultural identity. This is quite clearly the case in certain parts of France, notably Alsace and the south, and in Germany, especially in Bavaria. Both countries have right-wing political leaders who argue that excessive immigration can threaten the security of the nation-state itself. As a result, some analysts in nations like in France, Italy, Spain, and Switzerland feel that the political collapse of the secular regime in Algeria could trigger a new flood of refugees that would become a "transnational threat."

The Benefits of Immigration.

There is a certain amount of economic irony to some of these reactions. Europe has one of the lowest birthrates in the world, and no major European power could sustain its current population levels and economy without a considerable influx of immigrants every year. Governments across Europe have recognized this and have formulated their immigration policy accordingly.

Spain and Italy, for example, have the lowest birthrates in Europe. The Spanish government is all too aware of the dangers of an increasingly old and increasingly small population, and is desperate to keep the balance. Spain's projected growth rate in 1997 is of 49,336 people or an increase of 0.13 percent. The areas of significant growth also are not in the northern, richer parts of Spain such as Castilla y Leon or the Principado de Asturias, but in the poorer, southern areas, closer to Morocco such as Andalucia, Murcia, and the Islas Canarias off the coast of Africa.[6] Immigrants are the balancing factor in an otherwise shrinking and aging population.

The same is true in other parts of Europe. In 1997, Italy's population rose by 100,000 to 57.5 million. There were 540,000 births and 564,000 deaths. Only the arrival of 127,000 immigrants offset the negative imbalance. A French government report released in February 1997 concluded that without immigration, France's population would be 47 million today rather than 59 million. About 40 percent of the population increase since 1946 can be attributed directly or indirectly to immigration.[7] In addition, Europe is growing older year by year as people live longer—for example, the average life expectancy in Spain increased by an entire year between 1991 and 1994.[8]

Europe reaps the benefits of cheap labor with minimal social security costs. Foreign labor was essential in helping France, for example, achieve economic success in the post-World War II years. The immigrant workforce was

both numerically strong and inexpensive to employ, thus allowing French industries to increase production and profits while satisfying product demand. James F. Hollifield, in "*Searching for the New France,"* writes, " . . . foreign workers were [in the 50s and 60s] a more attractive source of labor because, unlike French workers, they were not covered by expensive and cumbersome social-welfare protections."[9]

The Cost of Immigration.

At the same time, immigration poses economic costs. The UK issued a White Paper on Immigration and Asylum on July 27, 1998, that aims to regulate the asylum application procedure. It indicated that the cost of the asylum system was around L500 million Sterling in 1997, or L6,500 per applicant. The Immigration Service Union estimated the total costs at L2 billion per year.

Immigrants make up a considerable part of the unemployed in Western Europe. In 1997, according to the Instituto Nacional de Estatistica (Spain), the unemployment rate for immigrants reached 34.9 percent compared to 20.9 percent of the general population.[10] A French census conducted by the OECD estimated the total immigrant population to be 3.6 million, or 6.3 percent of the total population. The same census put the foreign national share of unemployment at 12.5 percent—almost double their actual proportion of the population.[11] Foreign labor force totaled 1.6 million in France, roughly a third of whom came from the Maghreb countries. The other foreign workers mainly came from European Union countries (630,000), sub-Saharan countries, Turkey, and former Yugoslavia. By nationality, Algerians constituted the largest group of job seekers, followed by Moroccans, Portuguese, Tunisians, and Turks.[12]

Dealing with a large population of unemployed immigrants can have high costs. This often raises questions as to whether immigrants deserve social security from their

host nation when they have not made payments to the system. The fact that the host nation economy has benefited from the fact immigrants were so cheap because they did not pay for many social security costs is often forgotten. It is obvious, for example, that Middle Eastern immigrants were a major part of the unemployment problem in France, but did not dominate the problem. Nevertheless, the French far right label the 'Beurs' as responsible and as "parasites."

There are social costs to immigration. Immigration has changed the social structure of labor. In the case of France, introducing an African and Middle Eastern underclass led many French laborers to refuse to take the low paying jobs. Being a *femme de menage* is no longer a job for a French-woman, only Blacks or 'Beurs' clean public toilets. The French economy cannot function without a foreign underclass, but this does not prevent many Frenchmen from seeing foreign labor as a threat.

There is a sociological link between poverty and crime. Since a much greater proportion of immigrants live in conditions of poverty than in relative comfort, it follows that a higher proportion of them should be involved in crime. The Criminal Research Institute of Lower Saxony, for example, concluded that 62 percent of all juvenile offenders are Turks or "ethnic Germans."[13] Jean-Marie LePen, the President of the Front National—France's extreme right political party—charges that, while immigrants account for only 7 percent of the total population, they make up 30 percent of the prison population. While immigration advocates counter that a quarter of those in prison are only there for having entered France illegally in the first place, it is not surprising that the immigrant prison ratio should be high when immigrant poor live in greater poverty than the "French" poor.

The European Response.

Europe is reacting to the current impact of foreign residents by changing its immigration policies, and national approaches are mixed:

- The EU has passed a law that forces refugees to apply for asylum in the first EU country that they reach—be it poorer Greece or richer Sweden.

- Britain recently published a White Paper on Asylum which concluded that refugee status was being abused. The paper proposes to give applicants only one appeal against a rejection of their application. It promised to offer no amnesty to the rejected, to switch from cash to in-kind assistance, and to increase detention for those awaiting decisions.

- Spain is increasingly using an immigration barrier approach. Police detained almost 3,300 illegal immigrants at Madrid airport in 1997, most from South America. It is estimated that between 2,000 and 5,000 people, mostly from Morocco, try to cross the Straits of Gibraltar every year. By the end of 1998, a $35 million, 10-foot high fence will have been built around Spain's North African enclave city, Melilla. The funding has mostly come from the EU.

- Italian law changed in March 1998 to give the government the power to detain apprehended foreigners for 30 days in reception centers and then remove them from the country. Some 100,000 to 200,000 foreigners ordered to leave Italy are believed to still be in the country. Italy suffers from illegal immigration in much the same way as Spain.

- France's dealings with sending countries now give direct preferment to ex-colonies, and the 1993 and 1997 laws aimed at reducing illegal immigration and increasing deportations established a quota system

under which entrants from former French colonies would have priority.[14]

- There is a major debate over the various anti-immigration laws implemented under Pasqua, an Interior Minister in the early 1990s, and the subsequent bills, which involved polarized debates between the increasingly strong National Front and the left wing of French politics. There were demonstrations in February 1997 attacking legislation proposing to tighten visas and naturalization rules, and specifically targeting illegal immigration from former French colonies. One of the provisions of the bill was proposing to force French hosts to inform on their foreign guests to ensure that they did not outstay their visas.

- Germany advocates a new approach to political asylum. Germany welcomed several hundred thousand Bosnians (345,000?) when chaos broke out in the former Yugoslavia.[15] By October 1997, 85,000 of these had returned home, but this left 260,000 still in Germany. Germany has since begun deporting Bosnians in large numbers, but it has also called for an EU-wide harmonization of benefits for asylum seekers, and asked that future costs should be equally shared by members of the EU.

- The new German Socialist Democratic Party government has introduced immigration legislation which would make it relatively easy for immigrants to become citizens, even if they were not fully legal residents and could not speak German. The CDU-CSU-FDP opposition is divided over immigration. The FDP would like to permit dual nationality for children born of foreigners in Germany, and then have them choose which to keep at age 18. The CSU and CDU is strongly opposed. Fear of ever increasing Turkish immigration is the main

problem. The CDU-CSU election platform in Germany called for new requirements that would require foreigners to pass a German test to obtain a residence permit.

Unless a political-economic collapse takes place in a major Middle Eastern state, Europe seems to have more need for legal coordination and reform than for treating immigration as a "transnational threat." Europe can almost certainly limit the problem by routine legal means if governments have the courage to face the issue. If they do not, it is unclear that gun boats will help. Some hard choices also have to be made between the benefits and costs of immigration.

In the process, Europe must decide whether a given country needs cultural unity to function as a coherent political entity. The answers are now varied. Gunter Grass stirred up a controversy over Germany's asylum policy and Germany's policy of exporting weapons to Turkey in 1997, when he presented a literary award to a Kurdish author. Grass said that Germany was at heart unwilling to accept foreigners as fellow citizens, and talked of "a latent hatred of foreigners."[16] *LePen* and the *Front National* charge that

> ... French identity is threatened by immigration. Who can believe that France will remain the same if our country continues to cover itself in Mosques and our children are brought up to the sound of Arab or African wailings?[17]

Jacques Attali, *conseiller d'Etat* in France, draws a middle line. He talks of cultural integration; "France is not a race but a language, a civilization, and a land," he writes.

> It must be open to change if it is to grow. It must give room to foreign nationals living in France to keep their customs and adapt to France. The future will belong to multi-appurtenance, factor of tolerance, and to multi-allegiance, factor of democracy.[18]

A "Flood" from Morocco or Algeria: The Worst Case.

The situation will be very different, however, if immigration is driven by massive new political and economic pressures. Such pressures are unlikely to affect emigration from the Southern Gulf, or from any of the states in the Levant—barring an unforeseen collapse of the secular government in Egypt. The situation in North Africa, however, is different.

Algeria's corrupt military junta has failed to either win its war against its Islamists or make any material improvement in the living standards of its people. Algeria only has a per capita income of around $1,520, versus over $25,000 for high income Western states. It also has an extremely high population growth rate in spite of a decline in its crude birth rate. Estimates by the World Bank indicate that the average population growth rate is still 3.5 percent among the population in the age group from 15-64, and that the population momentum ratio is 1.6, which means that Algeria's population will reach at least 33 million after the year 2000, and 37 million by 2010. This compares with a population of only 19 million in 1980, and of 29 million in 1996.[19] Algeria has 11.6 million citizens between the ages of 13 and 32, and 1.6-3.5 million males of working age that might seek to immigrate in the face of a serious economic or political crisis.[20]

Morocco also presents problems, although its government is making serious efforts at political and economic reform. Its average per capita income is only $1,290, which makes even low-wage jobs in Europe extremely attractive. Estimates by the World Bank indicate that the average population growth rate is 2.7 percent among the population in the age group from 15-64, and that the population momentum ratio is 1.5, which means that Morocco's population will reach at least 25 million after the year 2000, and could reach 34 million by 2010. This compares with a population of only 19 million in 1980, and of 27 million in 1996.[21] Morocco has 10.8 million citizens

between the ages of 13 and 32, and 1.5-3.0 million males of working age in low income jobs that might seek to immigrate in the face of a serious economic or political crisis.[22]

Tunisia has a much smaller population base, and it, too, is attempting economic and political reform. The per capita income is $1,930. Estimates by the World Bank indicate that the average population growth rate is 1.5 percent among the population in the age group from 15-64, and that the population momentum ratio is 1.5, which means that Tunisia's population will reach at least 7 million after the year 2000, and could reach 11 million by 2010. This compares with a population of only six million in 1980, and of nine million in 1996.[23] Tunisia has 3.6 million citizens between the ages of 13 and 32, and about 600,000-900,000 males of working age in low income jobs that might seek to immigrate in the face of a serious economic or political crisis.[24]

The true "worst case" would be the economic and political collapse of Egypt, although such a case seems unlikely. Estimates by the World Bank indicate that the per capita income is $1,050. They also indicate that the average population growth rate is 2.6 percent among the population in the age group from 15-64, but that the population momentum ratio is 1.5, which means that Egypt's population will reach at least 58 million after the year 2000, and could reach 74 million by 2010. This compares with a population of only 41 million in 1980, and of 59 million in 1996.[25] Egypt has 21.6 million citizens between the ages of 13 and 32, and about 3.5-8.0 million males of working age in low income jobs that might seek to immigrate in the face of a serious economic or political crisis.[26]

There is no way to establish any probabilities for such worst cases, but it is clear that Europe would almost certainly be forced to create naval patrols to halt ships carrying illegal immigrants, adopt forced repatriation, and/or reject giving refugee status to all but a small cadre of

truly deserving cases. The EU and individual European nations can cope with the existing flow of immigrants, but not with true mass migration. At the same time, the political, economic, and social disparities between Europe and North Africa are also an argument for added economic aid, and for even stronger diplomatic efforts towards political reform. Even a moat as wide as the Mediterranean may fail to stop the flames if part of North Africa starts burning.

The United States and Immigration from the Middle East.

The United States has long been a nation of "foreigners." Today, it has about 26 million resident non-citizens, or 9.7 percent of its total population.[27] The United States has done well in dealing with legal immigrants, but faces a serious problem with illegal immigration. It is estimated that there were approximately 5 million undocumented immigrants residing in the United States in October 1996.[28] This population is assumed to be growing by about 275,000 per year. The American problem, however, is scarcely driven by the flow of immigrants from the Middle East. Most of these "illegals" (54 percent) are estimated to be from Mexico.

To put these numbers in perspective, 915,000 legal immigrants were admitted to the United States in 1996. Many of these legal immigrants were also Mexicans—163,572 or 17.9 percent of the total number of immigrants. The next ranking sources of immigrants were Philippinos, Indians, Vietnamese, Chinese, and residents of the Dominican Republic—with 40,000-55,000 immigrants each. The next ranking countries include Cuba, the Ukraine, Russia, Jamaica, Haiti, South Korea, El Salvador, Canada, and Poland in that order. Only one of the top 30 "sending" countries was Middle Eastern—Iran, which ranked 21st and sent less than 10,000 immigrants. An unknown number of illegals also entered the United States, but virtually all came from Latin America and Asia. Officials of the U.S. Immigration and Naturalization

Service estimate that only a negligible number of illegals came from the Middle East. There are probably more Russian illegals entering the United States each year than illegals from all Middle Eastern countries combined.[29]

The United States does not have a demographic problem with immigration from the Middle East, Arab, or Islamic world. However, it may have one in terms of prejudice. Middle Eastern immigration is linked to terrorism in the eyes of many Americans, and religious and cultural prejudice is sometimes an issue. In practice, Arab and Iranian immigrants are among the least violent and welfare-dependent of all immigrants to the United States, regardless of whether they are legal or illegal. While no precise statistics are available, U.S. experts estimate that the threat from terrorism has so far been negligible in both actuarial terms and in terms of activists as a percent of the total population. Latin American, Asia, and FSU immigrants have far higher percentages of overall violent crime per capita.

CHAPTER 4 - ENDNOTES

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CHAPTER 5

"CONVENTIONAL" TERRORISM

Middle Eastern terrorist attacks on the West present far fewer ambiguities than drugs and immigration, although there is still a need to keep this threat in perspective. While the media and fiction tend to concentrate on the terrorist threat from the Middle East, the U.S. intelligence community paints a very different picture. Table 5 shows that terrorism is a global problem, and that the Middle East is scarcely the center of terrorist activity.

The Role of the Middle East in Global Terrorism.

It should be stressed that the data in this table have severe limitations. Some of these limitations are definitional. The term "terrorism" is defined to mean premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience. The term "international terrorism" means terrorism involving citizens or the territory of more than one country. The term "terrorist group" means any group practicing, or that has significant subgroups that practice, international terrorism.

The U.S. State Department defines the term "noncombatant" to include both civilians and military personnel who are unarmed and/or not on duty at the time of the incident. For example, it includes the murders of the following U.S. military personnel: the 19 airmen killed in the 1996 bombing of the Khobar Towers housing facility in Saudi Arabia; Colonel James Rowe, killed in Manila in April 1989; Captain William Nordeen, U.S. defense attaché killed in Athens in June 1988; the two servicemen killed in the La Belle discotheque bombing in West Berlin in April 1986; and

Number of Incidents by Region	1990	1991	1992	1993	1994	1995	1996	1997
Africa	53	3	28	7	55	8	80	28
Asia	92	48	25	135	71	5,639	1,057	334
Eurasia	6	6	0	1	151	29	20	27
Europe	77	199	65	117	126	287	503	17
Latin America	163	229	374	66	329	46	17	12
Middle East	46	78	236	178	256	445	1,097	480
North America	0	2	1	1,006	0	0	0	7
Casualties (Dead & Wounded) by Region								
Africa	140	3	10	6	25	10	11	11
Asia	481	150	13	37	24	16	11	21
Eurasia	2	7	3	5	11	5	24	42
Europe	22	56	113	185	88	272	121	52
Latin America	92	68	143	97	58	92	84	128
Middle East	97	33	79	100	116	45	45	37
North America	0	0	2	1	0	0	0	13

Source: Adopted by Anthony H. Cordesman from material provided on-line at the U.S. State Department web site in annexes to the 1995, 1996, and 1997 editions of *Patterns of Global Terrorism*, and by the office of the Coordinator for Counterterrorism.

Table 5.
Patterns of Global International Terrorism by Region.

four off-duty U.S. Embassy marine guards killed in a cafe in El Salvador in June 1985. It also includes attacks on military installations or on armed military personnel when a state of military hostilities does not exist at the site, such as the bombings against U.S. bases in Europe, the Philippines, and elsewhere.

Discussions with U.S. experts indicate that some sensitive gray areas are not included in the data. These include Indian and Pakistani acts of terror in Kashmir, Turkish action against members of the PKK, and actions taken by Western intelligence organizations and Israel in counterterrorist operations. The most important limitation from the perspective of anyone in the regions involved is that data on transnational terrorism do not include acts of state or private terrorism within a given country. State and local terrorism within the Middle East, like terrorism in most other regions, kills and wounds several orders of magnitude more native citizens than are killed by terrorism against foreign targets or targets outside the region.

At the same time, it is important to point out that terrorist attacks do not focus exclusively on government officials, military personnel, or diplomats—although these are included in the data. Some reporting leaves the impression that Western governments are the key victims of terrorism. In fact, there were at least three times more casualties from business people and other nongovernmental civilians as from diplomats, other government personnel, and military in every year from 1990-1997.[1]

Nevertheless, Middle Eastern terrorism is still a very real transnational threat to the West. There have been very serious terrorist attacks on Western targets in the Middle East in the past, such as the bombing of the marine Corps Barracks in Beirut. There have also been bloody attacks outside the Middle East, such as the bombings of Pan Am flight #103 over Scotland in 1988 and the bombing of UTA flight #772 over Chad in 1989. The bombing of Pan Am flight #103 killed 259 people on board and 11 people on the ground, and the bombing of UTA flight #772 killed 171 people on board.

Terrorism is also a threat which may be sharply escalating. Middle Eastern attacks on Western targets dropped in frequency and intensity (casualties) after the Gulf War and Israel's peace agreement with the

Palestinians. This pattern may be reversing. The November 13, 1995, truck bombing of the National Guard Headquarters in Riyadh killed five U.S. service men and two Iranians. The June 25, 1996, bombing of the Khobar Towers killed 19 U.S. servicemen, and it involved a massive device. The 1998 attacks on the U.S. Embassies in Kenya and Tanzania involved massive numbers of innocent casualties—247 dead and over 5,000 wounded in the case of Kenya, and 10 dead and more than 75 wounded in the case of Tanzania. These attacks involved truck bombs with 600-800 pounds of explosives.

Civil tension in the Middle East has made tourists a growing target. For example, the worst terrorist attack in Egypt's history occurred on November 17, 1997. Six gunmen belonging to the Egyptian terrorist group al-Gama'at al-Islamiyya (Islamic Group or IG) entered the Hatsheput Temple in Luxor. For nearly half an hour, they methodically shot and knifed tourists trapped inside the Temple's alcoves. Fifty-eight foreign tourists were murdered, along with three Egyptian police officers and one Egyptian tour guide. The gunmen then fled the scene, although Egyptian security forces pursued them, and all six were killed. Terrorists launched a grenade attack on a tour bus parked in front of the Egyptian National Antiquities Museum in Cairo on September 18, 1997. Nine German tourists and an Egyptian bus driver were killed, and eight others were wounded.

The U.S. cruise missile attacks on targets in Afghanistan and the Sudan on August 20, 1998, reflected the fact that U.S. intelligence had reliable information that Osama Bin Laden, a leading sponsor and financier of terrorism, planned large-scale attacks on U.S. targets. The U.S. attack on the Shifa Pharmaceutical Plant in Khartoum was a preemptive attempt to prevent the production and use of VX nerve gas by Bin Laden's organization.

The Causes of Transnational Terrorism in the Middle East.

There are many causes of transnational terrorism in the Middle East, and many different Western targets:

- The United States is a major target because it projects the most power into the region, because of its close ties to Israel, because attacks on the United States produce the most world-wide publicity, and because the United States can often be used as a proxy for less popular attacks on Middle Eastern regimes.

- The breakdown in the Arab-Israeli peace process makes both Americans and others a target in Israel and other parts of the Middle East, both out of frustration and in an effort to break up the peace process.

- The failures of Middle Eastern secular governments, state terrorism and authoritarianism, economic hardship, social dislocation, and the alienation of youth combine to create extremism groups that not only attack their governments, but use Western targets as proxies. Motives can include attempting to drive out the Western military forces that provide Middle Eastern countries with security, cripple the economy to weaken governments, or win public recognition in the region. While some of these groups are secular, many claim to be Islamic in character. Some totally reject both secularism and any ties to the West or Western values.

- European nations can become the scene of attacks by opposition groups on the Embassies of Middle Eastern regimes, or by opposition groups attacking each other. Iran has sponsored state terrorist attacks on the People's Mujahideen and Kurdish opposition groups in France, Germany, Switzerland, and Turkey. Israel has killed Palestinians in nations like

Norway. France has become the scene of fighting between Algerian factions.

- Western tourists and businessmen can be the targets of terrorists in the Middle East, as such groups seek to put economic pressure on local regimes, or prove their status and power. For example, an Algerian terrorist group called the Armed Islamic Group (GIA) killed seven foreigners in Algeria in 1997, bringing the total number of foreigners the GIA has killed in Algeria to 133 (since 1992). Bombs have been used in civilian areas in Bahrain, although Westerners have not been major targets. Four U.S. businessmen, employees of Union Texas Petroleum, and their Pakistani driver were shot and killed in Karachi on November 12, 1998, when the vehicle in which they were riding was attacked by terrorists that seem to have been affiliated with Middle Eastern extremist groups.

- The West is often attacked on the basis of its values, and for corrupting Islamic countries and supporting secular regimes. While the United States is the primary target of such attacks, figures like the Saudi terrorist financier Osama Bin Laden want to drive all of the West out of the region. Bin Laden has previously claimed responsibility for anti-U.S. attacks in Somalia and Yemen. These include an attempt to bomb 10 U.S. servicemen in Yemen in December 1992. Bin Laden supplied arms to extremist groups opposing Operation RESTORE HOPE in Somalia in 1993, and seems to have financed the groups responsible for the World Trade Center bombing in 1993. He may have helped to finance and organize the bombing of the National Guard headquarters in Riyadh. He threatened to attack U.S. forces in Saudi Arabia to force a U.S. withdrawal from the region in March 1997. He continued to make statements threatening Western interests throughout 1997 and 1998, and made threats that

identify him as a possible sponsor of the bombings in Kenya and Tanzania. Bin Laden is claimed to finance and "guide" Arab "Afghani" movements with up to 3,000 members which have conducted operations in Somalia, Chechnya, Afghanistan, Bosnia, Tajikistan, and Yemen.[2]

Terrorist Groups and State Links to Terrorism.

The U.S. State Department has identified a long list of active terrorist groups in the Middle East. The identity and character of these groups are summarized in Appendix A, pp. 83-98. These groups, however, are only the visible side of terrorism. The social, economic, and political tensions in the Middle East constantly lead to the creation of new groups or splinter groups.[3] A wide range of Middle Eastern states have also carried out covert operations on Western soil. These include friendly states like Algeria, Egypt, Israel, and Morocco. They also include extremist sponsors of state terrorism like Iran, Iraq, and Libya.

Iran has conducted extensive operations, including assassinations, against members of its opposition. Some of the targets have been terrorist groups in their own right like the People's Mujahideen. Others have been moderates like ex-Prime Minister Bahktiar. Questions also remain regarding Iran's role in the Marine Corps Barracks bombing, bombings of the Israeli Embassy and a Jewish Cultural Center in Argentina, and the apartment complex in Al Khobar. A Berlin court found in April 1997 that the highest levels of Iran's political leadership followed a deliberate policy of murdering political opponents who lived outside the country. The court found four defendants guilty in the murders of four Iranian Kurdish opposition figures in Berlin's Mykonos restaurant in 1992. Three of those convicted were members of the Lebanese Hezbollah organization; the fourth was an Iranian national. The court judgment made it clear that other participants had escaped to Iran, where one of them was given a Mercedes for his role

in the operation. As a result, a German court issued an arrest warrant for former Iranian Minister of Intelligence and Security Ali Fallahian in March 1996.

Iraq sponsored an assassination attempt on President Bush in April 1993; has killed opposition figures in the Iraqi National Congress, and supports the People's Mujahideen in terrorist attacks in Iran. Iraq continues to have ties to the Abu Nidal Organization, the Abu Abbas faction of the PLF, Hamas, and the PFLP.

Libya and Qadhafi are the sponsors of the bombings of Pan Am #103 and UTA #772. Syria is a major sponsor of the Hezbollah, may have had some role in the Marine Corps Barracks bombing, and has never fully explained how Jafar Shuwaykat—a suspect in the Al Khobar bombing—died in Syrian custody. The Sudan has not been linked to attacks on targets in the West, but may have some responsibility for attacks on U.S. officials in the Middle East and for an assassination attempt on President Mubarak on June 26, 1995. The trial of five defendants suspected in the 1986 La Belle discotheque bombing opened in Berlin on November 18, 1997. Two U.S. soldiers, Sergeants Kenneth Ford and James Goins, were killed in this attack along with a Turkish citizen, and some 200 other persons were wounded, including 64 U.S. citizens. The United States believes the attack was sponsored by Libya.

The Sudan allows terrorist groups to train and operate, and to carry out terrorist actions—such as the June 1995 attack by Al-Gama'at al-Islamiyya against President Mubarak in Addis Ababa. It harbors a number of terrorist groups. These include one secular group, the Abu Nidal Organization, but most are Islamic extremist organizations. These include Hamas, the Lebanese Hezbollah, the Palestinian Islamic Jihad (PIJ), and Egypt's Al-Gama'at al-Islamiyya. The Sudanese government also supports Islamic and non-Islamic opposition groups in Algeria, Uganda, Tunisia, Ethiopia, and Eritrea.

The Sudan has tried to lower the profile of its support for terrorism, and expelled Bin Laden and members of some terrorist groups in 1996. However, Sudan has yet to comply with the U.N. Security Council Resolutions 1044, 1054, and 1070, which call on Sudan to extradite to Ethiopia the three suspects in the June 1995 assassination attempt against Egyptian President Mubarak and end its support for terrorism. Sudan has not cut off its support for terrorist organizations that continue to have a presence there. The Sudan also permits Bin Laden's groups to operate and allowed him to set up a plant to produce the precursors for VX nerve gas in Khartoum. The Sudan also still seems to have links to Abu Nidal, Hamas, the Palestinian Islamic Jihad, Lebanese Hezbollah, the Islamic Group in Egypt, and the Armed Islamic Group and Islamic Salvation Group in Algeria.

There are also links between state and "private" terrorism. While Iran has publicly attacked terrorism since the election of President Khatami, senior Western intelligence officials indicate that Iran's organizations for covert and terrorist operations remain intact and largely under the control of factions loyal to Iran's conservatives and extremists.

Syria works with Iran in supporting the Lebanese Hezbollah in training various terrorist groups and is a supporter of the PKK in its attacks on Turkey. It supports a number of Palestinian rejectionist groups, and Syrian intelligence has a long history of links to terrorism and extremist groups. Libya has links to a wide range of terrorist groups, including the Palestinian Islamic Jihad, PFLP-GC, and Abu Nidal Organization.

Afghanistan has become a key sponsor of terrorism, and permits a number of Middle Eastern terrorist organizations to operate on its soil. Islamic extremists—including large numbers of Egyptians, Algerians, Palestinians, and Saudis—continue to use Afghanistan as a training ground and home base. The Taliban and other combatants in the

Afghan civil war facilitate the operation of training and indoctrination facilities for non-Afghans in the territories they control. Several Afghani factions provide logistic support, free passage, and sometimes passports to the members of various terrorist organizations. These include groups and individuals involved in fighting in Bosnia and Herzegovina, Chechnya, Tajikistan, Kashmir, the Philippines, and parts of the Middle East.

As has been touched upon earlier, the Saudi-born terrorist financier Osama Bin Laden relocated from Jalalabad to the Taliban's capital of Qandahar in early 1997, and established a new base of operations. He continued to incite violence against the United States, particularly against U.S. forces in Saudi Arabia. Bin Laden called on Muslims to retaliate against the U.S. prosecutor in the Mir Aimal Kansi trial for disparaging comments he made about Pakistanis and praised the Pakistan-based Kashmiri group HUA in the wake of its formal designation as a foreign terrorist organization by the United States. According to the Pakistani press, following Kansi's rendition to the United States, Bin Laden warned the United States that, if it attempted his capture, he would "teach them a lesson similar to the lesson they were taught in Somalia."

New Forms of Terrorism?

The history of terrorism is a history of constant change and adaptation, generally leading to cycles of violence using a new type of attack that gains publicity and global attention and which is then repeated. Once again, it is difficult to put these threats into perspective. There are the "alarmists" who make every incident into a megatrend, every possible scenario into a cause for immediate action, every contact and liaison between extremists into a network, and every hostile political faction into a super-intelligent nest of demons.

These political "alarmists" are supported by "techno-alarmists" who exaggerate the ease of weaponizing and using new terrorist devices and the vulnerabilities of modern societies by several orders of magnitude. Finally, these two groups are supported by the "totalitarian solutionists" who support the alarmists by advocating solutions that would force the restructuring of modern societies—often in ways whose consequences would be worse than the real-world problem—and who often advocate unproven and extremely expensive technologies.

At the same time, anyone who has spent any time working on the problems posed by Middle Eastern terrorism is struck by the fact that even paranoids face real terrorists. It is impossible to ignore the growing vulnerability of modern society and the fact that major risks do exist. Similarly, it is impossible to study the subject without being struck by the gap that exists between the past failure of most terrorists to go beyond routine acts of terrorism and the potential damage new techniques and technologies and more effective forms of terrorism could do.

It is too early to be certain, but a pattern may be emerging where terrorists seek to maximize both damage and political impact by using steadily larger devices and/or seeking more numerous casualties. Some of this pattern seems to be a reaction to improved protection—terrorists use larger devices because they must attack from further outside a security perimeter. The Al Khobar bombings fit this pattern. Some cases may be accidents. The bombings of the U.S. embassies in Kenya and Tanzania produced very high civilian casualties because the terrorists never succeeded in getting as close to their target as originally planned. Cases like the World Trade Center, however, are clearly cases where terrorists sought to make the largest possible statement and produce the largest possible number of casualties.

"Super-terrorism" is technically easy. It is possible to postulate credible scenarios that produce much higher

levels of casualties from terrorism using conventional weapons and technologies. Exploding a jumbo jet, blowing up a crowded office building, destroying an isolated urban water supply, and destroying a key tunnel or bridge during peak traffic periods are typical cases in point.

It is equally possible to postulate serious economic and military costs from new forms of terrorism like cyber-terrorism and successful attacks on governmental data systems, military systems, national financial systems, and the control systems for key utility, energy processing and export facilities. Attacks on key utilities can have a massive disruptive effect. Attacks on key leaders can destabilize or paralyze some governments, and attacks on religious or highly sensitive political symbols can trigger levels of political disorder and violence out of any proportion to the casualties and physical damage involved.

While much of the current attention to terrorism focuses on the risk that terrorists may use steadily larger or more lethal devices, it is equally possible that terrorists will target the increasingly more complex and more integrated structures that allow modern societies to function. Water and power plants are good examples of local structures. So are commuting systems, public transportation, media, and key government officials and offices. Symbols of national culture—historical monuments, museums, churches, etc.—can often be destroyed with very small devices. The information systems that link national, regional, and the global economy are particularly attractive targets because they can often be attacked remotely through the Internet or by using viruses, hacking, and other methods that do not involve any detectable weapon.

A recent Israel commentary on information warfare in the Middle East summarized the threat as is shown in Table 6, which also includes World Bank data on the level of computer activity in Middle Eastern states.[4] "Information warfare" has become a fashionable buzz word, but there is no question that many Western systems are vulnerable to

Israeli Assessment*

Country	Internet In 1998	Super-computers	Vulnerability to Information Warfare	Potential for Information Warfare
Israel	65,000	yes	high	high
Iran	unknown	possible	moderate	low-moderate
Kuwait	6,500	yes	moderate-high	low
Jordan	300	no	low	low
Egypt	3,500	yes	low	moderate
Syria	unknown	no	low-moderate	low

World Bank Estimate of the National Technology Base**

Country	Personal Computers Per 1,000 People	Internet Server Per 10,000 People
Algeria	3.4	0.01
Bahrain	-	-
Egypt	5.8	0.31
Iran	32.7	0.00
Iraq	-	0.00
Israel	117.6	104.79
Jordan	7.2	0.38
Kuwait	74.1	21.72
Lebanon	7.9	21.03
Libya	-	0.01
Morocco	1.7	0.32
Oman	10.0	0.00
Qatar	-	-
Saudi Arabia	37.2	0.15
Sudan	0.7	0.00
Syria	1.4	0.00
Tunisia	6.7	0.02
Turkey	13.8	3.60
UAE	65.5	7.66
West Bank & Gaza	-	-
Yemen	-	0.00

* Adapted from work by Arielt T. Sobleman, “An Information Revolution in the Middle East?,” *Strategic Assessment*, Vol. 1, No. 2, July 1998, Tel Aviv: Jaffee Center for Strategic Studies, pp. 13-15.

** Source: Adapted by Anthony H. Cordesman from World Bank, *World Development Indicators, 1998*, Washington: World Bank, 1998, pp. 294-300.

Table 6. Information Warfare in the Middle East.

A recent Israel commentary on information warfare in the Middle East summarized the threat as is shown in Table 6, which also includes World Bank data on the level of computer activity in Middle Eastern states.[4] "Information warfare" has become a fashionable buzz word, but there is no question that many Western systems are vulnerable to external penetration. Middle Eastern terrorist organizations already use the Internet and global satellite phone systems to communicate and for propaganda purposes. They also use fax machines and many other modern devices.

There is no way to quantify the threat or provide a detailed description by group or country. It is clear, however, that some terrorist groups and state sponsors of terrorism in the Middle East also have enough sophistication to possess the potential to penetrate and attack Western information and data systems. Like international organized crime and other foreign threats, they are a warning that governments must defend themselves and make information warfare a priority. As for businesses, the now routine threat of computer crime is so serious that businesses that do not routinely and aggressively defend themselves are unlikely to survive.

Ridiculous as most novels and screenplays about super-terrorists may be, they conceal the same kernel of truth as exaggerated warnings from experts on counter-terrorism. The impact of Middle Eastern terrorism has so far been limited largely by the failure or unwillingness of terrorists to exploit new technologies and complex vulnerabilities, and not by the inherent difficulty in conducting much more lethal attacks. There are many credible means, and the West's protection consists largely of the lack of a real-world "Dr. No" or "Professor Moriarity."

Western Response.

Until recently, Western governments have been able to accept the risks and costs in taking a political and reactive

approach to potential new terrorist threats. There has often been an emphasis on agreements, conferences, and legal sanctions. Most Western governments are members of nine major multilateral conventions related to states' responsibilities for combating terrorism:

- Convention on offenses and certain other acts committed on board aircraft ("Tokyo Convention;" 9/63; applies to acts affecting in-flight safety).

- Convention for the suppression of unlawful seizure of aircraft ("Hague Convention;" 12/70; applies to hijackings).

- Convention for the suppression of unlawful acts against the safety of civil aviation ("Montreal Convention;" 9/71; applies to acts of aviation sabotage such as bombings aboard aircraft in flight).

- Convention on the prevention and punishment of crimes against internationally protected persons (12/73; protects senior government officials and diplomats).

- Convention on the physical protection of nuclear material (10/79; combats unlawful taking and use of nuclear material).

- International Convention against the taking of hostages (12/79).

- Protocol for the suppression of unlawful acts of violence at airports serving international civil aviation (2/88; extends and supplements Montreal Convention).

- Protocol for the suppression of unlawful acts against the safety of maritime navigation, with related protocol (3/88; applies to terrorist attacks on ships and on fixed offshore platforms).

- Convention on the marking of plastic explosives for the purpose of identification (provides for chemical marking to facilitate detection of plastic explosives, e.g. to combat aircraft sabotage; 3/91).

There are a host of formal and informal intelligence sharing and notification agreements. These often include informal relations with Middle Eastern governments or governments with Middle Eastern terrorists on their soil. Egypt, Jordan, Israel, the Palestinian authority, Kuwait, and Pakistan have provided considerable cooperation, but so have a number of other states. This has sometimes led to the transfer or extradition of terrorists or cooperation in suppressing their activities.

Key conferences have included the Summit of the Peacemakers in Egypt in March 1996, which took place after the assassination of Israeli Prime Minister Yitzhak Rabin and terrorist bombings in Israel. President Clinton called for and co-chaired a gathering of 29 regional and world leaders to design and support new counter-terrorism initiatives. Another example is the Paris Terrorism Ministerial, which took place on July 30, 1996. This conference made 25 recommendations which summarize current Western approaches to counterterrorism:[5]

1. Strengthen internal cooperation among government agencies which deal with different aspects of counter-terrorism.

2. Expand training of counterterrorism personnel.

3. Intensify consultations to improve the capability of governments to respond to terrorist attacks against public transport.

4. Accelerate research, development, and consultation on methods for detecting explosives and for tracing their origins.

5. Act against terrorist front organizations.

6. Prevent terrorist use of electronic or wire communications.

7. Adopt effective legal controls over terrorist devices.

8. Strengthen punishments for terrorist acts.

9. Prosecute terrorists and their supporters.

10. Refrain from supporting terrorists.

11. Accelerate consultations on law enforcement access to encrypted data.

12. Improve travel barriers to terrorists.

13. Prevent terrorist abuse of asylum.

14. Ratify international conventions.

15.Develop and enhance mutual legal assistance procedures.

16. Expand extradition arrangements.

17.Promote an international terrorist bombing convention. Seek ICAO action to establish international bomb detection standards and to heighten airport security.

18. Implement biological weapons controls.

19. Prevent terrorist fundraising.

20. Intensify information exchange on the international movement of funds for terrorist purposes.

21. Adopt regulatory measures to impede the movement of terrorists' funds.

22. Facilitate information exchange via central authorities.

23. Intensify exchange of basic information on persons and groups suspected of terrorist-linked activities.

24. Intensify the exchanges of operational information on suspect persons and groups.

25. Accelerate exchanges of information.

The United States has also attempted to legislate unilaterally against Middle Eastern terrorism. Some of these efforts have helped publicize and expose terrorism and its supporters, and it is important to note that the U.S. State Department Human Rights reports have done as much to expose state terrorism against the peoples of the Middle East as its reports on Patterns of Global Terrorism have done to expose transnational terrorism.

Some legislation has provoked more controversy than substance. The most famous (infamous?) example of such legislation is the "Iran and Libya Sanctions Act of 1996." This law imposed sanctions on foreign companies that engaged in specified economic transactions with Iran or Libya, and sanctioned companies that provided new investments over $40 million for the development of petroleum resources in Iran or Libya. The bill also sanctioned foreign companies that violate existing U.N. prohibitions against trade with Libya in certain goods and services such as arms, certain oil equipment, and civil aviation services.

If a violation occurs, the President is to impose two out of seven possible sanctions against the violating company. These sanctions included denial of Export-Import Bank assistance; denial of export licenses for exports to the violating company; prohibition on loans or credits from U.S. financial institutions of over $10 million in any 12-month period; prohibition on designation as a primary dealer for U.S. Government debt instruments; prohibition on serving as an agent of the United States or as a repository for U.S. Government funds; denial of U.S. government procurement opportunities (consistent with WTO obligations); and a ban on all or some imports of the violating company.

There have been relatively few Western uses of force against Middle Eastern terrorists, and most have involved gray areas related to quasi-military action by the Iranian and Iraqi governments. These cases include:

- *October 10, 1985:* U.S. F-14s divert an Egyptian airliner to a NATO base in Sicily. The aircraft was transferring PLO terrorists from Egypt to Tunisia who had been involved in the seizure of the Achille Lauro, and had released the ship on the condition of safe passage.

- *April 14, 1986:* U.S. Air Force and Navy jets bomb Libyan targets in retaliation for Libyan terrorist attacks on Americans in Europe.

- *October 19, 1987:* U.S. warships bombard an offshore Iranian oil rig that was harboring Iranian gunboats. The bombardment was retaliation for an Iranian missile attack on a U.S. tanker.

- *April 18, 1988:* U.S. ships and planes attack two Iranian oil platforms in the Gulf, after an April 14 incident in which a U.S. ship had been damaged by a mine. They sink two Iranian warships.

- *June 26, 1993:* U.S. ships launch cruise missile attacks on the headquarters of Iraqi intelligence in retaliation for an assassination plot against former President George Bush

- *August 21, 1998:* The U.S. launches 75 to 80 cruise missiles against a terrorist training complex in Afghanistan, and a plant suspected of producing the precursors for VX nerve gas in the Sudan. Significant damage is done to the training complex, and the plant is largely destroyed.

Western governments have generally found it best to limit any "war" on terrorism to rhetoric. There are often valid concerns that confrontations may provoke more terrorism while negotiations may reduce it. Taking major military action can lead to a host of complications with other governments, and accepting moderate casualties as the result of a terrorist activities has been more "cost-effective"

than carrying out expensive and aggressive efforts to prevent all forms of terrorism.

Once again, there is a need for perspective. Every activity in government—whether it is counterterrorism, road repair, or medical treatment—involves a tacit or explicit acceptance of actuarial trade-offs in cost-effectiveness in which a government accepts the death of its citizens in order to save money, preserve personal freedom, or concentrate on higher priority problems. Choices have to be made on something approaching an actuarial basis. When it comes to using government funds, it is scarcely important to the dead whether they were killed by government choices regarding counterterrorism or the funding of kidney transplants. It is equally unimportant whether they died as a result of deliberate bureaucratic choices or a decision to ignore the actuarial consequences of public policy.

Recent attacks and bombings have reached a scale, however, where the United States felt it was forced to attack terrorists in Afghanistan and the Sudan in August 1998. This may mark a major change in the previous pattern. There is little doubt that the United States will continue to be the focus of large-scale attacks by Middle East terrorists, and faces serious challenges in protecting its embassies, forces, other nationals and facilities abroad. Negotiation and legal efforts will continue to be key tools in the U.S. response, but terrorism is a form of asymmetric warfare, and the United States may have to deal with counterterrorism as a form of low intensity combat.

Whatever path the United States chooses, the problem is serious enough that all Western governments need to strengthen their intelligence efforts, and improve their warning. They need to strengthen immigration controls, and some aspects of internal security—particularly the surveillance and tracking of suspect groups and individuals. They also need to consider how to improve

emergency response and counterterrorist activities. Excessive vulnerability invites attack.

CHAPTER 5 - ENDNOTES

1. U.S. Department of State, *Patterns in Global Terrorism, 1995, 1996, 1997*, Appendix C, Statistical Review.

2. For historical background on Bin Laden, see Kenneth Katzman, "Persian Gulf: Radical Islamic Movements," Washington: Congressional Research Service, 96-731-F, August 30, 1996.

3. Also see Kenneth Katzman, "Terrorism: Middle Eastern Groups and State Sponsors, 1997," Washington: Congressional Research Service, 97-692F, July 10, 1997.

4. Arielt T. Sobleman, "An Information Revolution in the Middle East?," *Strategic Assessment*, Vol. 1, No. 2, July 1998, Tel Aviv: Jaffee Center for Strategic Studies, pp. 13-15.

5. Fact sheet released by the Office of the Coordinator for Counterterrorism, U.S. Department of State, December 11, 1997.

APPENDIX A

MAJOR MIDDLE EASTERN TERRORIST GROUPS

Abu Nidal Organization (ANO) a.k.a. Fatah Revolutionary Council, Arab Revolutionary Council, Arab Revolutionary Brigades, Black September, and Revolutionary Organization of Socialist Muslims

Description: International terrorist organization led by Sabri al-Banna. Split from PLO in 1974. Made up of various functional committees, including political, military, and financial.

Activities: Has carried out terrorist attacks in 20 countries, killing or injuring almost 900 persons. Targets include the United States, the United Kingdom, France, Israel, moderate Palestinians, the PLO, and various Arab countries. Major attacks included the Rome and Vienna airports in December 1985, the Neve Shalom synagogue in Istanbul, the Pan Am Flight 73 hijacking in Karachi in September 1986, and the City of Poros day-excursion ship attack in July 1988 in Greece. Suspected of assassinating PLO deputy chief Abu Iyad and PLO security chief Abu Hul in Tunis in January 1991. ANO assassinated a Jordanian diplomat in Lebanon in January 1994 and has been linked to the killing of the PLO representative there. Has not attacked Western targets since the late 1980s.

Strength: Several hundred plus militia in Lebanon and limited overseas support structure.

Location/Area of Operation: Currently headquartered in Libya with an operational presence in Lebanon in the Al Biqa' (Bekaa Valley) and also several Palestinian refugee camps in coastal areas of Lebanon. Also has a presence in Sudan, Syria, and Iraq, among others. Has demonstrated ability to operate over wide area, including the Middle East, Asia, and Europe.

External Aid: Has received considerable support, including safehaven, training, logistic assistance, and financial aid from Iraq and Syria (until 1987); probably continues to receive aid from Libya, in addition to close support for selected operations.

Al Quaida—see Quaida

Armed Islamic Group (GIA)

Description: An Islamic extremist group, the GIA aims to overthrow the secular Algerian regime and replace it with an Islamic state. The GIA began its violent activities in early 1992 after Algiers voided the victory of the Islamic Salvation Front (FIS)—the largest Islamic party—in the first round of December 1991 legislative elections.

Activities: Frequent attacks against civilians, journalists, and foreign residents. In the last year, the GIA has embarked on a terrorist campaign of civilian massacres, sometimes wiping out entire villages in its area of operations and frequently killing hundreds of civilians. Since announcing its terrorist campaign against foreigners living in Algeria in September 1993, the GIA has killed more than 100 expatriate men and women—mostly Europeans—in the country. The GIA uses assassinations and bombings, including car bombs, and it is known to favor kidnapping victims and slitting their throats. The GIA hijacked an Air France flight to Algiers in December 1994, and suspicions centered on the group for a series of bombings in France in 1995.

Strength: Unknown, probably several hundred to several thousand.

Location/Area of Operation: Algeria.

External Aid: Algerian expatriates and GIA members abroad, many of whom reside in Western Europe, provide some financial and logistic support. In addition, the Algerian Government has accused Iran and Sudan of supporting Algerian extremists and severed diplomatic relations with Iran in March 1993.

Azzam—See Quaida

Democratic Front for the Liberation of Palestine (DFLP)

Description: Marxist-Leninist organization founded in 1969 when it split from the Popular Front for the Liberation of Palestine (PFLP). Believes Palestinian national goals can be achieved only through revolution of the masses. In early 1980s, occupied political stance midway between Arafat and the rejectionists. Split into two factions in 1991; Nayif Hawatmah leads the majority and more hard-line faction, which continues to dominate the group. Joined with other rejectionist groups to form the Alliance of Palestinian Forces (APF) to oppose the Declaration of Principals signed in 1993. Broke from the APF—along with the PFLP—over ideological differences. Has made limited moves toward merging with the PFLP since the mid-1990s.

Activities: In the 1970s carried out numerous small bombings and minor assaults and some more spectacular operations in Israel and the occupied territories, concentrating on Israeli targets. Involved only in border raids since 1988, but continues to oppose the Israel-PLO peace agreement.

Strength: Estimated at 500 (total for both factions).

Location/Area of Operation: Syria, Lebanon, and the Israeli-occupied territories; terrorist attacks have taken place entirely in Israel and the occupied territories. Conducts occasional guerrilla operations in southern Lebanon.

External Aid: Receives limited financial and military aid from Syria.

al-Gama'at al-Islamiyya (Islamic Group, IG)

Description: An indigenous Egyptian Islamic extremist group active since the late 1970s; appears to be loosely organized with no single readily identifiable operational leader. Shaykh Umar Abd al-Rahman is the group's preeminent spiritual leader. Goal is to overthrow the government of President Hosni Mubarak and replace it with an Islamic state.

Activities: Armed attacks against Egyptian security and other government officials, Coptic Christians, and Egyptian opponents of Islamic extremism. The group also has launched attacks on tourists in Egypt since 1992. Al-Gama'at claimed responsibility for the attempt in June 1995 to assassinate President Hosni Mubarak in Addis Ababa, Ethiopia.

Strength: Unknown, but probably several thousand hard-core members and another several thousand sympathizers.

Location/Area of Operation: Operates mainly in the Al Minya, Asyu't, Qina, and Soha Governorates of southern Egypt. It also appears to have support in Cairo, Alexandria, and other urban locations, particularly among unemployed graduates and students.

External Aid: Unknown. Egyptian Government believes that Iran, Sudan, and Afghan militant Islamic groups support the group.

HAMAS (Islamic Resistance Movement)

Description: HAMAS was formed in late 1987 as an outgrowth of the Palestinian branch of the Muslim Brotherhood. Various elements of HAMAS have used both political and violent means, including terrorism, to pursue the goal of establishing an Islamic Palestinian state in place of Israel. HAMAS is loosely structured, with some elements working openly through mosques and social service institutions to recruit members, raise money, organize activities, and distribute propaganda. Militant elements of HAMAS, operating clandestinely, have advocated and used violence to advance their goals. HAMAS's strength is concentrated in the Gaza Strip and in a few areas of the West Bank. It also has engaged in peaceful political activity, such as running candidates in West Bank Chamber of Commerce elections.

Activities: HAMAS activists, especially those in the Izz el-Din al-Qassam Brigades, have conducted many attacks—including large-scale suicide bombings—against Israeli civilian and military targets, suspected Palestinian collaborators, and Fatah rivals.

Strength: Unknown number of hardcore members; tens of thousands of supporters and sympathizers.

Location/Area of Operation: Primarily the occupied territories, Israel, and Jordan.

External Aid: Receives funding from Palestinian expatriates, Iran, and private benefactors in Saudi Arabia and other moderate Arab states. Some fundraising and propaganda activities take place in Western Europe and North America.

Hezbollah or Hizballah (Party of God) a.k.a. Islamic Jihad, Revolutionary Justice Organization, Organization of the Oppressed on Earth, and Islamic Jihad for the Liberation of Palestine

Description: Radical Shia group formed in Lebanon; dedicated to creation of Iranian-style Islamic republic in Lebanon and removal of all non-Islamic influences from area. Strongly anti-Western and anti-Israeli. Closely allied with, and often directed by Iran, but may have conducted operations that were not approved by Tehran.

Activities: Known or suspected to have been involved in numerous anti-U.S. terrorist attacks, including the suicide truck bombing of the U.S. Embassy and U.S. marine barracks in Beirut in October 1983 and the U.S. Embassy Annex in Beirut in September 1984. Elements of the group were responsible for the kidnapping and detention of U.S. and other Western hostages in Lebanon. The group also attacked the Israeli Embassy in Argentina in 1992.

Strength: Several thousand.

Location/Area of Operation: Operates in the Al Biqa' (Bekaa Valley), the southern suburbs of Beirut, and southern Lebanon. Has established cells in Europe, Africa, South America, North America, and elsewhere.

External Aid: Receives substantial amounts of financial, training, weapons, explosives, political, diplomatic, and organizational aid from Iran and Syria.

International Islamic Jihad Against the Jews and Crusaders

A group formed by Osama Bin Laden in February 1998, which includes al Quaida, the Egyptian al-Gama'at al-Islamiyya, the Egyptian Islamic Jihad, the Harakat ul-Ansar, and two other groups. **(see Quaida)**

Islamic Army for the Liberation of Holy Shrines.(Claimed responsibility for the bombings of the U.S. Embassies in Kenya and Tanzania.) See al Quaida and International Islamic Jihad Against the Jews and Crusaders

Islamic Resistance Movement (see HAMAS)

Jamaat ul-Fuqra

Description: Jamaat ul-Fuqra is an Islamic sect that seeks to purify Islam through violence. Fuqra is led by Pakistani cleric Shaykh Mubarik Ali Gilani, who established the organization in the early 1980s. Gilani now resides in Pakistan, but most Fuqra cells are located in North America and the Caribbean. Fuqra members have purchased isolated rural compounds in North America to live communally, practice their faith, and insulate themselves from Western culture.

Activities: Fuqra members have attacked a variety of targets that they view as enemies of Islam, including Muslims they regard as heretics and Hindus. Attacks during the 1980s included assassinations and firebombings across the United States. Fuqra members in the United States have been convicted of criminal violations, including murder and fraud.

Strength: Unknown.

Location/Area of Operation: North America, Pakistan.

External Aid: None.

al-Jihad a.k.a. Jihad Group, Islamic Jihad, New Jihad Group, Vanguards of Conquest, Talaa' al- Fateh

Description: An Egyptian Islamic extremist group active since the late 1970s; appears to be divided into at least two separate factions: remnants of the original Jihad led by Abbud al-Zumar, currently imprisoned in Egypt, and a faction calling itself Vanguards of Conquest (Talaa' al-Fateh or the New Jihad Group). The Vanguards of Conquest appears to be led by Dr. Ayman al-Zawahiri, who is currently outside Egypt; his specific whereabouts are unknown. Like al-Gama'at al-Islamiyya, the Jihad factions regard Sheikh Umar Abd-al Rahman as their spiritual leader. The goal of all Jihad factions is to overthrow the government of President Hosni Mubarak and replace it with an Islamic state.

Activities: Specializes in armed attacks against high-level Egyptian Government officials. The original Jihad was responsible for the assassination in 1981 of President Anwar Sadat. Unlike al-Gama'at al-Islamiyya, which mainly targets mid- and lower-level security personnel, Coptic Christians, and Western tourists, al-Jihad appears to concentrate primarily on high-level, high-profile Egyptian Government

officials, including cabinet ministers. Claimed responsibility for the attempted assassinations of Interior Minister Hassan Al-Alfi in August 1993 and Prime Minister Atef Sedky in November 1993.

Strength: Not known, but probably several thousand hardcore members and another several thousand sympathizers among the various factions.

Location/Area of Operation: Operates mainly in the Cairo area. Also appears to have members outside Egypt, probably in Afghanistan, Pakistan, and Sudan.

External Aid: Not known. The Egyptian Government claims that Iran, Sudan, and militant Islamic groups in Afghanistan support the Jihad factions.

Kach and Kahane Chai

Description: Stated goal is to restore the biblical state of Israel. Kach (founded by radical Israeli-American Rabbi Meir Kahane) and its offshoot Kahane Chai, which means "Kahane Lives" (founded by Meir Kahane's son Binyamin following his father's assassination in the United States), were declared to be terrorist organizations in March 1994 by the Israeli Cabinet under the 1948 Terrorism Law. This followed the groups' statements in support of Dr. Baruch Goldstein's attack in February 1994 on the al-Ibrahimi Mosque—Goldstein was affiliated with Kach—and their verbal attacks on the Israeli Government.

Activities: Organize protests against the Israeli Government. Harass and threaten Palestinians in Hebron and the West Bank. Groups have threatened to attack Arabs, Palestinians, and Israeli Government officials. They also claimed responsibility for several shooting attacks on West Bank Palestinians in which four persons were killed and two were wounded in 1993.

Strength: Unknown.

Location/Area of Operation: Israel and West Bank settlements, particularly Qiryat Arba' in Hebron.

External Aid: Receives support from sympathizers in the United States and Europe.

Kurdistan Workers' Party (PKK)

Description: Established in 1974 as a Marxist-Leninist insurgent group primarily composed of Turkish Kurds. In recent years has moved beyond rural-based insurgent activities to include urban terrorism. Seeks to set up an independent Kurdish state in southeastern Turkey, where there is a predominantly Kurdish population.

Activities: Primary targets are Turkish Government security forces in Turkey but also has been active in Western Europe against Turkish targets. Conducted attacks on Turkish diplomatic and commercial facilities in dozens of West European cities in 1993 and again in spring 1995. In an attempt to damage Turkey's tourist industry, the PKK has bombed tourist sites and hotels and kidnapped foreign tourists.

Strength: Approximately 10,000 to 15,000 guerrillas. Has thousands of sympathizers in Turkey and Europe.

Location/Area of Operation: Operates in Turkey, Europe, the Middle East, and Asia.

External Aid: Receives safehaven and modest aid from Syria, Iraq, and Iran.

Mujahedin-e Khalq Organization (MEK or MKO) a.k.a. The National Liberation Army of Iran (NLA, the militant wing of the MEK), the People's Mujahedin of Iran (PMOI), Muslim Iranian Student's Society (front organization used to garner financial support)

Description: Formed in the 1960s by the college- educated children of Iranian merchants, the MEK sought to counter what is perceived as excessive Western influence in the Shah's regime. In the 1970s, the MEK concluded that violence was the only way to bring about change in Iran. Since then, the MEK—following a philosophy that mixes Marxism and Islam—has developed into the largest and most active armed Iranian dissident group. Its history is studded with anti-Western activity and, most recently, attacks on the interests of the clerical regime in Iran and abroad.

Activities: The MEK directs a worldwide campaign against the Iranian Government that stresses propaganda and occasionally uses terrorist violence. During the 1970s, the MEK staged terrorist attacks inside Iran to destabilize and embarrass the Shah's regime; the group killed several U.S. military personnel and civilians working on defense projects in Tehran. The group also supported the takeover in 1979 of the U.S. Embassy in Tehran. In April 1992 the MEK carried out attacks on Iranian embassies in 13 different countries, demonstrating the group's ability to mount large-scale operations overseas.

Strength: Several thousand fighters based in Iraq with an extensive overseas support structure. Most of the fighters are organized in the MEK's National Liberation Army (NLA).

Location/Area of Operation: In the 1980s the MEK's leaders were forced by Iranian security forces to flee to France. Most resettled in Iraq by 1987. Since the mid-1980s, the MEK has not mounted terrorist operations in Iran at a level similar to its activities in the 1970s. Aside

from the National Liberation Army's attacks into Iran toward the end of the Iran-Iraq war, and occasional NLA cross-border incursions since, the MEK's attacks on Iran have amounted to little more than harassment. The MEK has had more success in confronting Iranian representatives overseas through propaganda and street demonstrations.

External Aid: Beyond support from Iraq, the MEK uses front organizations to solicit contributions from expatriate Iranian communities.

Osama Bin Laden (see al Quaida)

The Palestine Islamic Jihad (PIJ)

Description: The PIJ, which originated among militant Palestinians in the Gaza Strip during the 1970s, is a series of loosely affiliated factions rather than a cohesive group. The PIJ is committed to the creation of an Islamic Palestinian state and the destruction of Israel through holy war. Because of its strong support for Israel, the United States has been identified as an enemy of the PIJ. The PIJ also opposes moderate Arab governments that it believes have been tainted by Western secularism.

Activities: PIJ militants have threatened to retaliate against Israel and the United States for the murder of PIJ leader Fathi Shaqaqi in Malta in October 1995. It has carried out suicide bombing attacks against Israeli targets in the West Bank, Gaza Strip, and Israel. The PIJ has threatened to attack U.S. interests in Jordan.

Strength: Unknown.

Location/Area of Operation: Primarily Israel and the occupied territories and other parts of the Middle East, including Jordan and Lebanon. The largest faction is based in Syria.

External Aid: Receives financial assistance from Iran and limited assistance from Syria.

Palestine Liberation Front (PLF)

Description: Terrorist group that broke away from the PFLP-GC in mid-1970s. Later split again into pro-PLO, pro-Syrian, and pro-Libyan factions. Pro-PLO faction is led by Muhammad Abbas (Abu Abbas), who became member of PLO Executive Committee in 1984 but left it in 1991.

Activities: The Abu Abbas-led faction has carried out attacks against Israel. Abbas's group was also responsible for the attack in 1985 on the cruise ship Achille Lauro and the murder of U.S. citizen Leon Klinghoffer. A warrant for Abu Abbas's arrest is outstanding in Italy.

Strength: At least 50.

Location/Area of Operation: PLO faction based in Tunisia until Achille Lauro attack. Now based in Iraq.

External Aid: Receives support mainly from Iraq, has received support from Libya in the past.

PKK (see Kurdistan Workers' Party)

Popular Front for the Liberation of Palestine (PFLP)

Description: Marxist-Leninist group founded in 1967 by George Habash as a member of the PLO. Joined the Alliance of Palestinian Forces (APF) to oppose the Declaration of Principles signed in 1993 and has suspended participation in the PLO. Broke away from the APF, along with the DFLP, in 1996 over ideological differences. Has made limited moves toward merging with the DFLP since the mid-1990s.

Activities: Committed numerous international terrorist attacks during the 1970s. Since 1978, PFLP has carried out numerous attacks against Israeli or moderate Arab targets, including the killing of a settler and her son in December 1996.

Strength: Some 800.

Location/Area of Operation: Syria, Lebanon, Israel, and the occupied territories.

External Aid: Receives most of its financial and military assistance from Syria and Libya.

Popular Front for the Liberation of Palestine-General Command (PFLP-GC)

Description: Split from the PFLP in 1968, claiming that it wanted to focus more on fighting and less on politics. Violently opposed to Arafat's PLO. Led by Ahmad Jibril, a former captain in the Syrian Army. Closely tied to both Syria and Iran.

Activities: Has carried out numerous cross-border terrorist attacks into Israel using unusual means, such as hot-air balloons and motorized hang gliders.

Strength: Several hundred.

Location/Area of Operation: Headquartered in Damascus, bases in Lebanon, and cells in Europe.

External Aid: Receives logistic and military support from Syria and its financial support from Iran.

Quaida (al-Quaida, Osama Bin Laden)

Description. An umbrella organization led by Osama bin Laden and formed out of elements of the Maktab al-Khidamat (MAK) or Services

Office. Bin Laden and a member of the Palestinian Moslem Brotherhood called Abdallah Azzam founded the MAK in Peshawar in the mid-1980s to provide money and volunteers to the Afghan resistance. The MAK eventually had recruitment and fund-raising centers in many places, including the U.S., Egypt, Saudi Arabia, and Pakistan. Thousands of volunteers were recruited, transported, and trained from over 50 countries—many from Saudi Arabia. Bin Laden used his money (up to several hundred million dollars) to import heavy equipment to cut roads and tunnels, and create storage depots in Afghanistan. Bin Laden is also known to have fought bravely against the Soviets in 1986 at the battle of Jaji and at the battle of Shaban in 1987. Bin Laden split with Azzam in 1988. Bin Laden wanted to attack the "enemies of Islam" all over the world, and Azzam wanted to provide military support to Muslims waging military campaigns. Bin Laden formed a new organization in 1989 called al Quaida (the base). Azzam was assassinated in 1989 by a car bomb, the MAK split, and many of his supporters joined Bin Laden. Bin Laden returned to Saudi Arabia after the Soviets withdrew from Afghanistan in 1989. He was expelled in 1991, and moved al-Quaida's operations to the Sudan, where it became steadily more hostile to the U.S., secular movements in the Middle East, Shi'ites, and Western culture. As a result of U.S. pressure, the Sudan expelled Bin Laden in May 1996, following the Sudan's alleged role in an assassination attempt on President Mubarak in Ethiopia in 1995. Bin Laden has since been in Afghanistan.

Activities: Highly active in sponsoring or supporting terrorism throughout the Middle East. Bin Laden declared war on the U.S. in 1996, and praised the bombings in Riyadh and Al Khobar in November 1996. He formed the International Islamic Jihad Against the Jews and Crusaders in February 1998, which includes al Quaida, the Egyptian al-Gama'at al-Islamiyya, the Egyptian Islamic Jihad, the Harakat ul-Ansar, and two other groups. Probably a key sponsor of the bombings of the U.S. Embassy in Kenya and Tanzania in August 1998.

Location: Several centers in Afghanistan. Possibly officers and facilities in the Sudan. Ties to many other Sunni Islamic terrorist groups like the EIJ, IJ, etc. It supports Muslim fighters and Islamic terrorists in Afghanistan, Bosnia, Chechnya, Tajikistan, Somalia, Yemen, and Kosovo. It trains volunteers from countries ranging from the Philippines to Algeria and Eritrea.

External aid: Bin Laden remains wealthy, but there are indications that al-Quaida is financed by wealthy Islamists in Saudi Arabia, other Arab states, Europe, and the U.S. It receives some support from the Sudanese government and the Taliban in Afghanistan.

Revolutionary Organization 17 November (17 November)

Description : A radical leftist group established in 1975 and named for the November 1973 student uprising in Greece protesting the military regime. The group is anti-Greek establishment, anti-United States, anti-Turkey, anti-NATO; committed to the ouster of U.S. bases, removal of Turkish military presence from Cyprus, and severing of Greece's ties to NATO and the European Union (EU). Organization is obscure, possibly affiliated with other Greek terrorist groups.

Activities: Initial attacks were assassinations of senior U.S. officials and Greek public figures. Added bombings in 1980s. Since 1990, has expanded targets to include EU facilities and foreign firms investing in Greece and has added improvised rocket attacks to its methods.

Strength: Unknown, but presumed to be small.

Location/Area of Operation: Athens, Greece.

External Aid: Unknown.

Revolutionary People's Liberation Party/Front (DHKP/C) a.k.a. Devrimci Sol (Revolutionary Left), Dev Sol

Description: Originally formed in 1978 as Devrimci Sol, or Dev Sol, it was a splinter faction of the Turkish People's Liberation Party/Front. Renamed in 1994 after factional infighting, it still espouses a Marxist ideology and is virulently anti-United States and anti-NATO. The group finances its activities chiefly through armed robberies and extortion.

Activities: Since the late 1980s, has concentrated attacks against current and retired Turkish security and military officials. Began a new campaign against foreign interests in 1990. Protesting the Gulf War, it assassinated two U.S. military contractors and wounded a U.S. Air Force officer. Launched rockets at U.S. Consulate in Istanbul in 1992. Assassinated prominent Turkish businessman in early 1996, which was its first significant terrorist act as DHKP/C.

Strength: Unknown.

Location/Area of Operation: Carries out attacks in Turkey, primarily in Istanbul, Ankara, Izmir, and Adana. Conducts fundraising operations in Western Europe.

External Aid: Unknown.

World Islamic Front for the Jihad Against the Jews and Crusaders (See al Quaida and International Islamic Jihad Against the Jews and Crusaders)

Note: The list of terrorist groups is not exhaustive, and focuses on the groups that were designated foreign terrorist organizations on October 8. Terrorist groups whose activities were limited in scope in 1997 were not included.

Source: This list is excerpted from U.S. State Department, *Patterns of Global Terrorism, 1997*, Appendix B, Background Information on Terrorist Groups, and from background material provided by the Department of Defense.

CHAPTER 6

PROLIFERATION AND LONG-RANGE MISSILE STRIKES

Proliferation is a growing problem in the Middle East, and one that is not likely to diminish in the near future. Appendix B describes the complex pattern of proliferation in the region. It also shows that the range of delivery systems is steadily expanding, that Iran has missiles under development that could strike targets deep in Europe, and that Iran and Iraq have at least examined much longer-range systems in the past.

The nations listed in Appendix B are so different in terms of regime, goals, and behavior that it is obvious that there is no regional threat to the West, but rather the possibility that individual states might pose a threat to individual Western nations or interests. Three major proliferators—Iran, Iraq, and Libya—are of special interest. These are nations that have posed a threat to the West in the past and which have also sponsored attacks of state terrorism against Western targets/and or on Western soil.

Appendix B shows that Iran currently poses the most significant near-term threat in terms of acquiring biological and nuclear weapons and long-range missiles that might strike Europe or the United States. In spite of Iranian denials, there is little doubt that Iran has an active nuclear and biological weapons program, and it has already begun to test long-range missiles. Iran's capabilities, however, will remain highly limited for the next decade, and Iran faces a strong regional threat from Israel. While Iran's regime may or may not become truly moderate in character, it has become progressively more pragmatic since the death of Khomeini, and it is far from clear that it would take

"existential" risks of the kind posed by such an attack on the West.

Libya has the dubious distinction of being the only Middle Eastern state to have fired a long-range missile on a Western target—it fired on the Italian island of Lampadusa following the U.S. raid on Tripoli. At the same time, Libya's grandiose military plans have ended in failure. Libya has some chemical weapons capability, but has failed to develop ballistic missiles with longer ranges than the Scud. It has explored biological and nuclear weapons programs, but there is little evidence of success.

Appendix B describes Iraq's massive efforts to proliferate and to acquire long-range missiles and biological and nuclear weapons. These programs would already pose a serious potential threat to the West had they not been halted by the Gulf War and by the efforts of UNSCOM and the IAEA. The appendix shows that most of Iraq's past capabilities have been largely destroyed. As a result, it is not Iraq's past capabilities that threaten the West, but rather the break out capabilities listed in Appendix C.

It currently seems unlikely that even the most radical Middle Eastern power would readily take the risk of directly confronting the West, given the relative military weakness of key potential threats and the risk of massive retaliation. No Middle Eastern state can disregard the fact that any use of a biological or nuclear weapon that produced massive casualties could trigger devastating conventional strategic strikes or even the use of nuclear weapons by the West.

At the same time, there are dangers in assuming that Middle Eastern states will always behave as "rational actors." The history of the region is filled with miscalculations, erratic behavior, and risk taking. Behavior can alter rapidly in a crisis, and the most threatening states have single rulers or small groups of ruling elites that may choose to escalate in ways that are far less conservative than Western planners would escalate under similar conditions.

The following scenarios may not represent even moderate probability cases, but they are plausible enough to deserve serious consideration:

- Weapons of mass destruction might be used against key energy and energy export facilities in intra-regional conflicts, posing a major economic threat.

- Attacks might be carried out on Western power projection forces in the region, or the threat of such attacks might be used to try to force a regional power to expel Western power projection forces or carry out other acts hostile to Western interests.

- Threats against the West, demonstrative long-range missile attacks against targets in the West, or low-level uses of weapons of mass destruction might be used to try to force Western nations to support the policies of a given Middle Eastern state, or intervene in a regional conflict. The escalation of an Israeli-Syrian conflict, or future Iranian-Iraqi conflict might lead to such a threat.

- A regional power might set up a launch-under-attack system targeted on the West in an effort to deter Western intervention or military action. Such a system might be created to prevent Western counterproliferation strikes.

- The threat, demonstrative use, or larger scale use of such weapons might be undertaken in an effort to force an end to sanctions.

- A regime on the edge of collapse might lash out, feeling it had nothing to lose and accepting the risk of broader retaliation against the nation. Alternatively, a nation under nuclear attack by Israel might feel that attacks were justified against Western targets, particularly U.S. bases.

- Middle Eastern states are not limited to conventional forms of warfare. While a great deal of attention focuses on long-range missiles, a Middle Eastern state might use unconventional delivery means or a terrorist proxy to deliver such weapons—hoping that it would not be identified as the source or that enough ambiguity would exist to prevent a decisive response.

- Technology or fissile material transfers might suddenly destabilize the balance. This might include the transfer of long-range missiles or fissile material, or key components and technology for missiles and weapons. This could suddenly alter the regional balance and the perceived risk in threatening the West or Western interests.

Once again, the problem is to balance possible risks against probable risks, and draw suitable consequences for policy. The actions of most Middle East states and leaders are normally cautious, and self-preservation is normally the highest single priority. The developments in Appendix B also still represent limited war fighting capabilities.

It does seem prudent, however, for the West to continue to develop much stronger counterproliferation capabilities. Such counterproliferation capabilities might include a mix of the following efforts:

- Efforts to convince nonweapons of mass destruction states that their security interests are best served through *not* acquiring weapons of mass destruction.

- Expansion of arms control programs such as strengthening the NNPT, CTB, and BWC. Related options include establishing a stronger COCOM successor regime, and improving controls on exports and technology by strengthening the MTCR, Nuclear Suppliers Group, and Australia Group. Encourage regional efforts such as nuclear free zones,

conventional arms treaties that stabilize arms races, and confidence- and security-building measures.

- Clarify the Anti-Ballistic Missile Treaty to allow deployment of advanced theater ballistic missile defenses.

- Defuse potentially dangerous situations by undertaking actions to reduce the threat from weapons of mass destruction already in the hands of selected countries—such as agreements to destroy, inspect, convert, monitor, or even reverse their capabilities.

- Create military capabilities to seize, disable, or destroy weapons of mass destruction in time of conflict.

- Improve detection and characterization of biological and chemical agents. Accelerate the fielding of stand-off detection, point detection, and characterization systems. Address the integration of sensors into existing and planned carrier platforms, emphasizing man-portability and compatibility with UAVs.

- Seek new sensors, enhanced lethality, and penetrating weapons to increase the probability of destroying stockpiles of weapons, delivery systems, and production methods, while minimizing the risk of collateral damage.

- Improve detection, characterization, and defeat of hard, underground targets.

- Improve detection, localization, and neutralization of weapons of mass destruction inside and outside the nation. Identify and evaluate systems, force structures, and operational plans to protect key military facilities and logistic nodes, and to conduct

joint exercises to improve the capability to respond to potential biological and chemical threats.

- Deploy new passive defense capabilities, including development and production of biological agent vaccines. Develop and field improved protective suits, shelters, filter systems, and equipment. Develop improved decontamination methods and passive defensive capabilities (protective gear and vaccines) that will mitigate or neutralize the effects of weapons of mass destruction and enable forces to fight effectively even on a contaminated battlefield.

- Develop the capability to deploy missile defense capabilities, with primary emphasis on theater ballistic missile defenses. Such activity involves improvements in active and passive defenses, attack operations, and improvements in BM/C^4I as well as the deployment of theater missile defenses. The primary focus, however, is on anti-ballistic missile defenses.

- Declare counterstrike options ranging from conventional strikes devastating a user nation's economy, political structure, and military forces to the use of nuclear weapons against the population centers of user nations.

- Expand forces tailored to dealing with terrorist and unconventional threats and supporting them with new intelligence and tracking systems dedicated to the prevention of mass terrorism, and tailored special forces to detect and attack terrorist groups and to deal with unconventional uses of weapons of mass destruction.

- Deny access to technology and materials for weapons of mass destruction through export controls and other tools. Punish violators with trade sanctions to publicize and expose companies and countries that

assist proliferators, and to share intelligence to heighten awareness of the proliferation problem.

Arms control programs and efforts to block technology and weapons transfers are the cheapest and potentially the most effective items on this list. It should be noted in this regard that the mix of Russian, Chinese, and North Korean transfers summarized in Appendix B poses a major indirect transnational threat to the West. Further, there are numerous cases in which the West has acted as a transnational threat to itself, carelessly transferring weapons and technology to the Middle East that may eventually be used against it.

APPENDIX B

THE THREAT POSED BY PROLIFERATION IN THE MIDDLE EAST

Algeria's Search for Weapons of Mass Destruction.

Delivery Systems

- 10 Su-24 long range strike aircraft.
- 40 MiG-23BN fighter ground attack aircraft.
- Tube artillery and multiple rocket launchers.
- Possible modification of Soviet SS-N-2B Styx.

Chemical Weapons

- Possible development. No evidence of deployed systems.

Biological Weapons

- Some early research activity.
- No evidence of production capability.

Nuclear Weapons

- Deliberately sought to create a covert nuclear research program under military control with Chinese support.
- Secretly built a research reactor (Es Salam) at the Ain Oussera nuclear research facility. This was announced to be a 10-15 megawatt reactor using heavy water and low enriched uranium. The size of its cooling towers, however, indicated it might be as large as 60 megawatts. It was also located far from population centers, had no visible electric generating facilities and was defended by SA-5s. There were also indications Algeria might be constructing a facility to separate out weapons grade plutonium.
- Exposure led to Algeria's agreement to place the facility under IAEA inspection in May 1991, and adhere to the NPT in May 1993. It formally acceded to the NPT on January 12, 1995.
- Exposure to public opinion and Western objections and economic/political crisis may have halted further progress.

- Algeria does, however, have uranium deposits west of Tamanrasset in southeast Algeria, has a 1 megawatt reactor (Nur) at Draria on the coast east of Algiers, and has hot cells for the production of radioactive isotopes at Draria.

- A Spanish paper, *El Pais*, claimed on August 23, 1998 that Spain's military secret service, the CESID, had issued a report has said that Algeria will be able in two years to produce military-grade plutonium, a key ingredient for making atomic weapons. The report is said to have concluded that Algeria had forged ahead with a nuclear program with Chinese and Argentine technical support that far exceeded its civilian needs, despite having signed the international nuclear non-proliferation treaty. The report is said to have been submitted to the Spanish government in July and to have sounded a warning of the danger involved if Algeria decided to divert its nuclear program to military purposes. The report indicated that the nuclear complex at Birine, 250 km (155 miles) south of Algiers, already had a heavy-water reactor in operation capable of producing weapons-grade plutonium. The CESID report stated that Algeria "has all the installations needed to carry out activities linked to the complete cycle for the creation of military plutonium" by the end of the century, the newspaper said. CESID concluded that if the Algerian government decided to change its current policy of not acquiring atomic weapons, "the knowledge gathered by a significant team of technicians and scientists, in addition to the availability of facilities ... will place this country in the position of initiating a program of military purposes."

Libya's Search for Weapons of Mass Destruction.

Delivery Systems

- Has developed a liquid-fueled missile with a range of 200 kilometers. No evidence of deployment.

- Al-Fatih solid-fueled missile with 300-450 mile range reported to have been under development with aid of German technical experts, but no signs of successful development.

- FROG-7 rocket launchers with 40 kilometer range.

- Deployed 80 Scud B launchers with 190 mile range in 1976, but could not successfully operate system. Many of the launchers and missiles sold to Iran.

- Purchased SS-N-2C and SSC-3 cruise missiles. Little operational capability.

- Pursued other missile development programs with little success.
- Tu-22 bombers with minimal operational capability.
- Su-24 long-range strike fighters. These are operational and have limited refueling capability using C-130s.
- Operational Mirage 5D/DE and 10 Mirage 5DD fighter ground attack aircraft.
- Mirage F-1AD fighter ground attack aircraft.
- MiG-23BM Flogger F and 14 MiG-23U fighter ground attack.
- Su-20 and Su-22 Fitter E, J, F fighter ground attack aircraft.
- Tube artillery and multiple rocket launchers.
- Fired Scud missiles against the Italian island of Lampadusa in 1987.

Chemical Weapons

- Claims will not sign CWC as long as other states have nuclear weapons.
- May have used mustard gas delivered in bombs by AN-26 aircraft in final phases of war against Chad in September 1987.
- Pilot plant near Tripoli has been producing small amounts of chemical weapons since early 1980s.
- Are probably two other small research/batch production facilities.
- Main nerve and mustard gas production facilities in an industrial park at chemical weapons plant at Rabta. This plant can produce both the poison gas and the bombs, shells, and warheads to contain it. Are probably two other research facilities.
- Rabta Plant seems to have started test runs in mid-1988. It is a 30 building facility defended by SAM batteries and special troops. Has sheltered underground areas.
    - Libya has acquired large stocks of feedstocks for mustard gas like thiodiglycol and precursors for nerve gas, and extensive amounts have been sent to Rabta.
    - At least 100 metric tons of blister and nerve agents have been produced at Rabta since the late 1980s, but production rate has been very low and plant is either not successful or is not being utilized because of fear of attack.

- The plant would have a capacity of 100 metric tons per year if operated at full capacity.
- Fabricated fire at Rabta in 1990 to try to disguise the function of plant and fact was operating.
- German courts have convicted a German national in October 1996, for selling Libya a computer designed for use in chemical weapons programs and helping Libya to import equipment to clean the waste emissions from poison gas production from India using an Irish dummy corporation.

- Additional major chemical weapons plant in construction in extensive underground site near Tarhunah, a mountainous area 65 kilometers southeast of Tripoli, but few recent signs of activity.
- Tarhunah has been designed to minimize its vulnerability to air attack and has twin tunnels 200-450 feet long, protected by 100 feet of sandstone above the tunnels and a lining of reinforced concrete. This is far beyond the penetration capabilities of the U.S. GBU-27B and GBU-28 4 bombs. The GBU-28 can penetrate a maximum of 25-30 meters of earth or 6 meters of concrete.
- Libya rejected the proposal of President Mubarak that it open the Tarhuna facility to third country inspection to prove it was not a chemical weapons facility in April 1996.
- Reports of construction of another sheltered major facility near Sabha, 460 miles south of Tripoli.
- Reports of Chinese, North Korean, German, Swiss, and other European technical support and advisors.
- Reports of shipments of chemical weapons to Syria and Iran do not seem valid.
- Very low quality weapons designs with poor fusing and lethality.

Biological Weapons

- Some early research activity.
- No evidence of production capability.

Nuclear Weapons

- Has sought to create a development and production capability, but no evidence of any real progress or success.
- Unsuccessfully attempted to buy nuclear weapons from China in the 1970s.

- Qaddhafi called for Libyan production of nuclear weapons on April 29, 1990.
- Has explored for uranium, but no active mines or uranium mills.
- 10 megawatt, Soviet-supplied nuclear research reactor at Tajura acquired from the USSR in 1970s. Operates under IAEA safeguards.
- Had plan to build at 440 megawatt, Soviet-supplied reactor near the Gulf of Sidra in the 1970s, but canceled project.
- Ratified NPT is 1975. Declares all facilities under IAEA safeguards.
- Continues to train nuclear scientists and technicians abroad.

Egypt's Search for Weapons of Mass Destruction.

Delivery Systems

- Cooperation with Iraq in paying for development and production of "Badar 2000" missile with a 750-1,000 kilometer range. This missile is reported to be a version of the Argentine Condor II or Vector missile. Ranges were reported from 820-980 kilometers, with the possible use of an FAE warhead.
    - Egyptian officers were arrested for trying to smuggle carbon materials for a missile out of the U.S. in June 1988.
    - Covert U.S. efforts seem to have blocked this development effort.
- Has Scud B TELs and approximately 100 missiles with 300 kilometers range.
- Reports that Egypt has developed a plant to produce an improved version of the Scud B, and possibly Scud C, with North Korean cooperation.
- North Korean transfers include equipment for building Scud body, special gyroscope measuring equipment and pulse-code modulation equipment for missile assembly and testing.
- Reports in June 1996 that has made major missile purchase from North Korea, and will soon be able to assemble such missiles in Egypt. Seven shipments from North Korea reported in March and April.
- Media reports that U.S. satellites detected shipments of Scud C missile parts to Egypt in February-May, 1996—including

rocket motors and guidance devices—do not seem correct. The Scud C has a range of roughly 480 kilometers.

- The CIA reported in June 1997, however, that Egypt had acquired Scud B parts from Russia and North Korea during 1996.
- U.S. suspects Egypt is developing a liquid-fueled missile called the Vector with an estimated range of 600-1200 kilometers.
- Another liquid-fueled missile under development known as 'Project T' has an estimated range of 450 kilometers.
- FROG 7 rocket launch units with 40 kilometers range.
- Cooperation with Iraq and North Korea in developing the Saqr 80 missile. This rocket is 6.5 meters long and 210 mm in diameter, and weighs 660 kilograms. It has a maximum range of 50 miles (80 kilometers) and a 440 pound (200 kilogram) warhead. Longer range versions may be available.
- AS-15, SS-N-2, and CSS-N-1 cruise missiles.
- F-4E fighter ground attack aircraft.
- Mirage 5E2 fighter ground attack.
- Mirage 2000EM fighters.
- F-16A and 80 F-16C fighters.
- Multiple rocket launcher weapons.
- Tube artillery.

Chemical Weapons

- Produced and used mustard gas in Yemeni civil war in 1960s, but agents may have been stocks British abandoned in Egypt after World War II. Effort was tightly controlled by Nasser and was unknown to many Egyptian military serving in Yemen.
- Completed research and designs for production of nerve and cyanide gas before 1973.
- Former Egyptian Minister of War, General Abdel Ranny Gamassay stated in 1975 that, "if Israel should decide to use a nuclear weapon in the battlefield, we shall use the weapons of mass destruction that are at our disposal."
- Seems to have several production facilities for mustard and nerve gas. May have limited stocks of bombs, rockets, and shells.

- Unconfirmed reports of recent efforts to acquire feed stocks for nerve gas. Some efforts to obtain feed stocks from Canada. May now be building feed stock plants in Egypt.
- Industrial infrastructure present for rapid production of cyanide gas.

Biological Weapons

- Research and technical base.
- No evidence of major organized research activity.

Nuclear Weapons

- Low level research effort. No evidence of more than basic research since the 1960s.

Israel's Search for Weapons of Mass Destruction.

Delivery Systems

- New IRBM/ICBM range high payload booster developed with South Africa.
- A major missile test took place on September 14, 1989. It was either a missile test or failure of Ofeq-2 satellite.
- Israel has done technical work on a TERCOM type smart warhead. It has examined cruise missile guidance developments using GPS navigation systems.
- Up to 50 "Jericho I" missiles deployed in shelters on mobile launchers with up to 400 miles range with a 2,200 pound payload, and with possible nuclear warhead storage nearby.
- Jericho II missiles now deployed, and some were brought to readiness for firing during the Gulf War.
- These missiles seem to include a single stage follow-on to the Jericho I and a multistage longer range missile.
    - The missile seems to have a range of up to 900 miles with a 2,200 pound payload, and may be a cooperative development with South Africa. (Extensive reporting of such cooperation in press during October 25 and 26, 1989).
    - Commercial satellite imaging indicates the missile may be 14 meters long and 1.5 meters wide. Its deployment configuration hints that it may have radar area guidance similar to the terminal guidance in the Pershing II.
- Jericho II missile production facility at Be'er Yakov.

- Unverified claims that up to 100 missiles are deployed west of Jerusalem.
- A missile base exists at Zachariah, several miles southeast of Tel Aviv.
- Limestone region with caves, to shelter missiles, Transport-Erector-Launchers (TELs), and vehicles.
- TELs have been seen at this base on vehicles 16 meters long, 4 meters wide, and 3 meters high. May be road mobile for dispersal.
- They carry missiles 14 meters long and 1.5 meters wide.
- There seem to be 50 missiles deployed at the base.
- Each TEL has three support vehicles. One is a guidance programmer and power vehicle. Another seems to be a firing control vehicle, and the third seems to be a communications vehicle.
- The base is not hardened against nuclear attack, and would be vulnerable to chemical and biological attack.
- Israel's current review of its military doctrine seems to include a review of its missile basing options, and the study of possible hardening and dispersal systems. There are also reports that Israel will solve its survivability problems by deploying some form of nuclear-armed missile on its new submarines.
- F-15, F-16, F-4E, and Phantom 2000 fighter-bombers capable of long range refueling and of carrying nuclear and chemical bombs.
- Tel Nof may be the air base used to arm aircraft with nuclear weapons. Storage facilities may exist at Zachariah
- Lance missile launchers and 160 Lance missiles with 130 kilometers range.
- Variant of the Popeye air-to-surface missile believed to have nuclear warhead.
- MAR-290 rocket with 30 kilometers range believed to be deployed
- MAR-350 surface-to-surface missile with range of 56 miles and 735 lb. payload believed to have completed development or to be in early deployment.

- Israel is seeking super computers for Technion Institute (designing ballistic missile RVs), Hebrew University (may be engaged in hydrogen bomb research), and Israeli Military Industries (maker of "Jericho II" and Shavit booster).

Chemical Weapons

- Reports of mustard and nerve gas production facility established in 1982 in the restricted area in the Sinai near Dimona seem incorrect. May have additional facilities. May have capacity to produce other gases. Probable stocks of bombs, rockets, and artillery.
- Extensive laboratory research into gas warfare and defense.
- Development of defensive systems includes Shalon Chemical Industries protection gear, Elbit Computer gas detectors, and Bezal R&D air crew protection system.
- Extensive field exercises in chemical defense.
- Gas masks stockpiled, and distributed to population with other civil defense instructions during Gulf War.
- Warhead delivery capability for bombs, rockets, and missiles, but none now believed to be equipped with chemical agents.

Biological Weapons

- Extensive research into weapons and defense.
- Ready to quickly produce biological weapons, but no reports of active production effort.

Nuclear Weapons

- Director of CIA indicated in May 1989, that Israel may be seeking to construct a thermonuclear weapon.
- Has two significant reactor projects: the 5 megawatt HEU light-water IRR I reactor at Nahal Soreq; and the 40-150 megawatt heavy water, IRR-2 natural uranium reactor used for the production of fissile material at Dimona. Only the IRR-1 is under IAEA safeguards.
- Dimona has conducted experiments in pilot scale laser and centrifuge enrichment, purifies UO_2, converts UF_6, and fabricates fuel for weapons purposes.
- Uranium phosphate mining in Negev, near Beersheba, and yellow cake is produced at two plants in the Haifa area and one in southern Israel.

- Pilot-scale heavy water plant operating at Rehovot.
- Estimates of numbers and types of weapons differ sharply.
  - Stockpile of at least 60-80 plutonium weapons.
  - May have well over 100 nuclear weapons assemblies, with some weapons with yields over 100 kilotons.
  - U.S. experts believe Israel has highly advanced implosion weapons. Known to have produced Lithium-6, allowing production of both tritium and lithium deuteride at Dimona. Facility no longer believed to be operating.
  - Some weapons may be ER variants or have variable yields.
  - Stockpile of up to 200-300 weapons is possible.
- Major weapons facilities include production of weapons grade plutonium at Dimona, nuclear weapons design facility at Nahal Soreq (south of Tel Aviv), missile test facility at Palmikim, nuclear armed missile storage facility at Kefar Zekharya, nuclear weapons assembly facility at Yodefat, and tactical nuclear weapons storage facility at Eilabun in eastern Galilee.

Missile Defenses

- Patriot missiles with future PAC-3 upgrade to reflect lessons of the Gulf War.
- Arrow 2 two-stage ATBM with slant intercept ranges at altitudes of 8-10 and 50 kilometers and speeds of up to Mach 9, plus possible development of the Rafale AB-10 close in defense missile with ranges of 10-20 kilometers and speeds of up to Mach 4.5. Taas rocket motor, Rafael warhead, and Tadiran BM/C4I system and “Music” phased array radar.
- Israel plans to deploy three batteries of the Arrow to cover Israel, each with four launchers, to protect up to 85 percent of its population. It seeks to deploy the system early in the 2000s.
- The program has progressed with considerable success since phase two tests, with successful flights on August 20, 1996 and March 11, 1997. Development costs are estimated at $330 million with Israel paying 28 percent and the U.S. paying 72 percent. Deployment will be jointly funded under a 1996 accord, as a part of a $556 million six-year program. Israel will pay 64 percent and the U.S. 36 percent. The total program cost is estimated at $1.6 billion.

- The Arrow will be deployed in batteries as a wide area defense system with intercepts normally at reentry or atmospheric altitudes. Capable of multi-target tracking and multiple intercepts.
- Israel is also examining the possibility of boost-phase defenses.

Advanced Intelligence Systems

- The Shavit I launched Israel's satellite payload on September 19, 1989. It used a three stage booster system capable of launching a 4,000 pound payload over 1,200 miles or a 2,000 pound payload over 1,800 miles. It is doubtful that it had a payload capable of intelligence missions and seems to have been launched, in part, to offset the psychological impact of Iraq's missile launches.
- Ofeq 2 launched in April 1990—one day after Saddam Hussein threatens to destroy Israel with chemical weapons if it should attack Baghdad.
- Launched first intelligence satellite on April 5, 1995, covering Syria, Iran, and Iraq in orbit every 90 minutes. The Ofeq 3 satellite is a 495 pound system launched using the Shavit launch rocket, and is believed to carry an imagery system. Its orbit passes over or near Damascus, Tehran, and Baghdad.

Syria's Search for Weapons of Mass Destruction.

Delivery Systems

- Four SSM brigades: 1 with FROG, 1 with Scud Bs, 1 with Scud Cs, and 1 with SS-21s.
- New long range North Korean Scud Cs deployed.
    - Two brigades of 18 launchers each are said to be deployed in a horseshoe shaped valley. This estimate of 36 launchers is based on the fact there are 36 tunnels into the hillside. The launchers must be for the Scud C since the older Scud Bs would not be within range of most of Israel. Up to 50 missiles are stored in bunkers to the north as possible reloads. There is a maintenance building and barracks.
    - Estimates indicate that Syria has 24-36 Scud launchers for a total of 120 missiles of all types. The normal ratio of launchers to missiles is 10:1, but Syria is focusing on both survivability and the capability to launch a large preemptive strike.
    - The Scud Cs have ranges of up to 550-600 kilometers.

- Possible nerve gas warheads with cluster bomblets reported in September 1997
- CEP of 1,000-2,600 meters.
- A training site exists about 6 kilometers south of Hama, with an underground facility where TELs and missiles are stored.

- Up to 12 additional Scud B launchers and 200 Scud B missiles with 310 kilometers range. Believed to have chemical warheads. Scud B warhead weighs 985 kilograms.
- 18 SS-21 launchers and at least 36 SS-21 missiles with 80-100 kilometers range. May be developing chemical warheads.
- Reports of Chinese deliveries of missiles do not seem correct:
  - Reports of PRC deliveries of missile components by China Precision Machinery Company, maker of the M-11, in July 1996. The M-11 has a 186 mile range with a warhead of 1,100 pounds.
  - Some sources believe M-9 missile components, or M-9-like components delivered to Syria. Missile is reported to have a CEP as low as 300 meters.
- Sheltered or underground missile production/assembly facilities at Aleppo and Hamas have been built with aid from Chinese, Iranian, and North Korean technicians. Possibly some Russian technical aid.
- A missile test site exists 15 kilometers south of Homs where Syria has tested missile modifications and new chemical warheads. It has heavy perimeter defenses, a storage area and bunkers, heavily sheltered bunkers, and a missile storage area just west of the site.
  - Syria has shorter range systems:
  - Short range M-1B missiles (up to 60 miles range) seem to be in delivery from PRC.
  - SS-N-3 and SSC-1b cruise missiles.
- May be converting some long-range surface-to-air and naval cruise missiles to use chemical warheads.
- 20 Su-24 long-range strike fighters.
- 30-60 operational MiG-23BM Flogger F fighter ground attack aircraft.

- 20 Su-20 fighter ground attack aircraft.
- 60-70 Su-22 fighter ground attack aircraft.
- 18 FROG-7 launchers and rockets.
- Negotiations for PRC-made M-9 missile (185-375 mile range).
- Multiple rocket launchers and tube artillery.

Chemical Weapons

- First acquired small amounts of chemical weapons from Egypt in 1973.
- Began production of non-persistent nerve gas in 1984. May have had chemical warheads for missiles as early as 1985.
- Experts believe has stockpiled 500 to 1,000 metric tons of chemical agents.
- Believed to have begun deploying VX in late 1996, early 1997.
    - CIA reported in June 1997 that Syria had acquired new chemical weapons technology from Russia and Eastern Europe in 1996.
    - Unconfirmed reports of sheltered Scud missiles with unitary Sarin or Tabun nerve gas warheads deployed in caves and shelters near Damascus.
    - Tested Scuds in manner indicating possible chemical warheads in 1996.
    - Seems to have cluster warheads and bombs.
    - May have VX and Sarin in modified Soviet ZAB-incendiary bombs and PTAB-500 cluster bombs.
- Acquired design for Soviet Scud warhead using VX in 1970s.
- Major nerve gas, and possible other chemical agent production facilities north of Damascus. Two to three plants.
    - One facility is located near Homs and is located next to a major petrochemical plant. It reportedly produces several hundred tons of nerve gas a year.
    - Reports is building new major plant near Aleppo.
    - Reports that a facility co-located with the Center d'Etdues et de Recherche Scientifique (CERS) is developing a warhead with chemical bomblets for the Scud C.

- Many parts of the program are dispersed and compartmented. Missiles, rockets, bombs, and artillery shells are produced/modified and loaded in other facilities.
- Wide range of delivery systems:
  - Extensive testing of chemical warheads for Scud Bs. May have tested chemical warheads for Scud Cs.
  - Shells, bombs, and nerve gas warheads for multiple rocket launchers.
  - FROG warheads may be under development.
  - Reports of SS-21 capability to deliver chemical weapons are not believed by U.S. or Israeli experts.
  - Israeli sources believe Syria has binary weapons and cluster bomb technology suitable for delivering chemical weapons.

Biological Weapons

- Signed, but not ratified the 1972 Biological and Toxin Weapons Convention. Extensive research effort.
- ACDA report in August 1996 indicated that, "it is highly probable that Syria is developing an offensive biological capability."
- Extensive research effort. Reports of one underground facility and one near the coast.
- Probable production capability for anthrax and botulism, and possibly other agents.
- Israeli sources claim Syria weaponized Botulin and Ricin toxin in early 1990s, and probably anthrax.
- Limited indications may be developing or testing biological variations on ZAB-incendiary bombs and PTAB-500 cluster bombs and Scud warheads.

Nuclear Weapons

- Ongoing research effort.
- No evidence of major progress in development effort.
- Announced nuclear reactor purchase plans including 10 megawatt research reactor and six power reactors in 1980s, but never implemented.

- Has miniature 30 kilowatt neutron-source reactor, but unsuitable for weapons production.

Missile Defenses

- Seeking Russian S-300 surface-to-air missile system with limited anti-tactical ballistic missile capability.

Iran's Search for Weapons of Mass Destruction.

Delivery Systems

- The Soviet-designed Scud B (17E) guided missile currently forms the core of Iran's ballistic missile forces—largely as a result of the Iran-Iraq War.
    - Iran only acquired its Scuds in response to Iraq's invasion. It obtained a limited number from Libya and then obtained larger numbers from North Korea. It deployed these units with a special Khatam ol-Anbya force attached to the air element of the Pasdaran. Iran fired its first Scuds in March 1985. It fired as many as 14 Scuds in 1985, 8 in 1986, 18 in 1987, and 77 in 1988. Iran fired 77 Scud missiles during a 52 day period in 1988, during what came to be known as the "war of the cites." Sixty-one were fired at Baghdad, nine at Mosul, five at Kirkuk, one at Takrit, and one at Kuwait. Iran fired as many as five missiles on a single day, and once fired three missiles within 30 minutes. This still, however, worked out to an average of only about one missile a day, and Iran was down to only 10-20 Scuds when the war of the cities ended.
    - Iran's missile attacks were initially more effective than Iraq's attacks. This was largely a matter of geography. Many of Iraq's major cities were comparatively close to its border with Iran, but Tehran and most of Iran's major cities that had not already been targets in the war were outside the range of Iraqi Scud attacks. Iran's missiles, in contrast, could hit key Iraqi cities like Baghdad. This advantage ended when Iraq deployed extended range Scuds.
    - The Scud B is a relatively old Soviet design which first became operational in 1967, designated as the R-17E or R-300E. The Scud B has a range of 290-300 kilometers with its normal conventional payload. The export version of the missile is about 11 meters long, 85-90 centimeters in diameter, and weighs 6,300 kilograms. It has a nominal CEP of 1,000 meters. The Russian versions can be equipped with conventional high explosive, fuel air explosive, runway penetrator, submunition, chemical, and nuclear warheads.

- The export version of the Scud B comes with a conventional high explosive warhead weighing about 1,000 kilograms, of which 800 kilograms are the high explosive payload and 200 are the warhead structure and fusing system. It has a single stage storable liquid rocket engine and is usually deployed on the MAZ-543 eight wheel transporter-erector-launcher (TEL). It has a strap-down inertial guidance, using three gyros to correct its ballistic trajectory, and uses internal graphite jet vane steering. The warhead hits at a velocity above Mach 1.5.

- Most estimates indicate that Iran now has 6-12 Scud launchers and up to 200 Scud B (R-17E) missiles with 230-310 KM range.

- Some estimates give higher figures. They estimate Iran bought 200-300 Scud Bs from North Korea between 1987 and 1992, and may have continued to buy such missiles after that time. Israeli experts estimate that Iran had at least 250-300 Scud B missiles, and at least 8-15 launchers on hand in 1997.

- U.S. experts also believe that Iran can now manufacture virtually all of the Scud B, with the possible exception of the most sophisticated components of its guidance system and rocket motors. This makes it difficult to estimate how many missiles Iran has in inventory and can acquire over time, as well as to estimate the precise performance characteristics of Iran's missiles, since it can alter the weight of the warhead and adjust the burn time and improve the efficiency of the rocket motors.

- Iran has new long-range North Korean Scuds—with ranges near 500 kilometers.

  - The North Korean missile system is often referred to as a "Scud C." Typically, Iran formally denied the fact it had such systems long after the transfer of these missiles became a reality. Hassan Taherian, an Iranian foreign ministry official, stated in February 1995, "There is no missile cooperation between Iran and North Korea whatsoever. We deny this."

  - In fact, a senior North Korean delegation traveled to Tehran to close the deal on November 29, 1990, and met with Mohsen Rezaei, the former commander of the IRGC. Iran either bought the missile then, or placed its order shortly thereafter. North Korea then exported the missile through its Lyongaksan Import Corporation. Iran imported some of

these North Korean missile assemblies using its B-747s, and seems to have used ships to import others.

- Iran probably had more than 60 of the longer range North Korean missiles by 1998, although other sources report 100, and one source reports 170.
- Iran may have 5-10 Scud C launchers, each with several missiles. This total seems likely to include four new North Korean TELs received in 1995.
- Iran seems to want enough missiles and launchers to make its missile force highly dispersible.
- Iran may have begun to test its new North Korean missiles. There are reports it has fired them from mobile launchers at a test site near Qom about 310 miles (500 kilometers) to a target area south of Shahroud. There are also reports that units equipped with such missiles have been deployed as part of Iranian exercises like the Saeqer-3 (Thunderbolt 3) exercise in late October 1993.
- The missile is more advanced than the Scud B, although many aspects of its performance are unclear. North Korea seems to have completed development of the missile in 1987, after obtaining technical support from the People's Republic of China. While it is often called a "Scud C," it seems to differ substantially in detail from the original Soviet Scud B. It seems to be based more on the Chinese-made DF-61 than on a direct copy of the Soviet weapon.
- Experts estimate that the North Korean missiles have a range of around 310 miles (500 kilometers), a warhead with a high explosive payload of 700 kilograms, and relatively good accuracy and reliability. While this payload is a bit limited for the effective delivery of chemical agents, Iran might modify the warhead to increase payload at the expense of range and restrict the using of chemical munitions to the most lethal agents such as persistent nerve gas. It might also concentrate its development efforts on arming its Scud C forces with more lethal biological agents. In any case, such missiles are likely to have enough range-payload to give Iran the ability to strike all targets on the southern coast of the Gulf and all of the populated areas in Iraq, although not the West. Iran could also reach targets in part of eastern Syria, the eastern third of Turkey, and cover targets in the border area of the former Soviet Union, western Afghanistan, and western Pakistan.

- Accuracy and reliability remain major uncertainties, as does operational CEP. Much would also depend on the precise level of technology Iran deployed in the warhead. Neither Russia nor the People's Republic of China seem to have transferred the warhead technology for biological and chemical weapons to Iran or Iraq when they sold them the Scud B missile and CSS-8. However, North Korea may have sold Iran such technology as part of the Scud C sale. If it did so, such a technology transfer would save Iran years of development and testing in obtaining highly lethal biological and chemical warheads. In fact, Iran would probably be able to deploy far more effective biological and chemical warheads than Iraq had at the time of the Gulf War.

- Iran may be working with Syria in such development efforts, although Middle Eastern nations rarely cooperate in such sensitive areas. Iran served as a transshipment point for North Korean missile deliveries during 1992 and 1993. Some of this transshipment took place using the same Iranian B-747s that brought missile parts to Iran. Others moved by sea. For example, a North Korean vessel called the *Des Hung Ho*, bringing missile parts for Syria, docked at Bandar Abbas in May 1992. Iran then flew these parts to Syria. An Iranian ship coming from North Korea and a second North Korean ship followed, carrying missiles and machine tools for both Syria and Iran. At least 20 of the North Korean missiles have gone to Syria from Iran, and production equipment seems to have been transferred to Iran and to Syrian plants near Hama and Aleppo.

- Iran has created shelters and tunnels in its coastal areas which it could use to store Scud and other missiles in hardened sites and reduce their vulnerability to air attack.

- Iran can now assemble Scud and Scud C missiles using foreign-made components.

- Iran is developing an indigenous missile production capability with both solid and liquid fueled missiles. Seems to be seeking capability to produce MRBMs.

    - The present scale of Iran's production and assembly efforts is unclear. Iran seems to have a design center, at least two rocket and missile assembly plants, a missile test range and monitoring complex, and a wide range of smaller design and refit facilities.

- The design center is said to located at the Defense Technology and Science Research Center, which is a branch of Iran's Defense Industry Organization, and located outside Karaj—near Tehran. This center directs a number of other research efforts. Some experts believe it has support from Russian and Chinese scientists.

- Iran's largest missile assembly and production plant is said to be a North Korean-built facility near Isfahan, although this plant may use Chinese equipment and technology. There are no confirmations of these reports, but this region is the center of much of Iran's advanced defense industry, including plants for munitions, tank overhaul, and helicopter and fixed wing aircraft maintenance. Some reports say the local industrial complex can produce liquid fuels and missile parts from a local steel mill.

- A second missile plant is said to be located 175 kilometers east of Tehran, near Semnan. Some sources indicate this plant is Chinese-built and began rocket production as early as 1987. It is supposed to be able to build 600-1,000 Oghab rockets per year, if Iran can import key ingredients for solid fuel motors like ammonium perchlorate. The plant is also supposed to produce the Iran-130.

- Another facility may exist near Bandar Abbas for the assembly of the Seersucker. China is said to have built this facility in 1987, and is believed to be helping the naval branch of the Guards to modify the Seersucker to extend its range to 400 kilometers. It is possible that China is also helping Iran develop solid fuel rocket motors and produce or assemble missiles like the CS-801 and CS-802. There have, however, been reports that Iran is developing extended range Scuds with the support of Russian experts, and of a missile called the Tondar 68, with a range of 700 kilometers.

- Still other reports claim that Iran has split its manufacturing facilities into plants near Pairzan, Seman, Shiraz, Maghdad, and Islaker. These reports indicate that the companies involved in building the Scuds are also involved in Iran's production of poison gas and include Defense Industries, Shahid, Bagheri Industrial Group, and Shahid Hemat Industrial Group.

- Iran's main missile test range is said to be further east, near Shahroud, along the Tehran-Mashhad railway. A telemetry station is supposed to be 350 kilometers to the south at Taba, along the Mashhad-Isfahan road. All of these

facilities are reportedly under the control of the Islamic Revolutionary Guards Corps.

- There were many reports during the late 1980s and early 1990s that Iran had ordered the North Korean No Dong missile, which was planned to have the capability to carry nuclear and biological missile ranges of up to 900 kilometers. This range would allow the missile could reach virtually any target in Gulf, Turkey, and Israel. The status of the No Dong program has since become increasingly uncertain, although North Korea deployed some developmental types at test facilities in 1997.

- The No-Dong underwent flight tests at ranges of 310 miles (500 kilometers) on May 29, 1993. Some sources indicate that Iranians were present at these tests. Extensive further propulsion tests began in August 1994, and some reports indicate operational training began for test crews in May 1995. Missile storage facilities began to be built in July 1995, and four launch sites were completed in October 1995.

- The progress of the program has been slow since that time, and may reflect development problems. However, mobile launchers were seen deployed in northeast North Korea on March 24, 1997. According to some reports, a further seven launcher units were seen at a facility about 100 kilometers from Pyongyang.

- The No-Dong 1 is a single-stage liquid-fueled missile, with a range of up to 1,000 to 1,300 kilometers (810 miles), although longer ranges may be possible with a reduced warhead and maximum burn. There are also indications that there may be a No-Dong 2, using the same rocket motor, but with an improved fuel supply system that allows the fuel to burn for a longer period.

- The missile is about 15.2 meters long—four meters longer than the Scud B—and 1.2 meters in diameter. The warhead is estimated to weigh 770 kilograms (1,200-1,750 pounds) and a warhead manufacturing facility exists near Pyongyang. The No-Dong has an estimated theoretical CEP of 700 meters at maximum range, versus 900 meters for the Scud B, although its practical accuracy could be as wide as 3,000-4,000 meters. It has an estimated terminal velocity of Mach 3.5, versus 2.5 for the Scud B, which presents added problems for tactical missile defense. The missile is be transportable on a modified copy of the MAZ-543P TEL that has been lengthened with a fifth axle and which is roughly 40 meters long. The added support stand for the vertical

launch modes brings the overall length to 60 meters, and some experts questioned whether a unit this big is practical.

- Other reports during the later 1980s and early 1990s indicated that Iran was also interested in two developmental North Korean IRBMs called the Tapeo Dong 1 and Tapeo Dong 2.
    - The Tapeo Dong 1 missile has an estimated maximum range of 2,000 kilometers, and the Tapeo Dong 2 may have a range up to 3,500 kilometers.
    - Both Tapeo Dongs are liquid fueled missiles which seem to have two stages.
    - Unlike the No-Dong, the Tapeo Dongs must be carried to a site in stages and then assembled at a fixed site. The No-Dong transporter may be able to carry both stages of the Tapeo Dong 1, but some experts believe that a special transporter is needed for the first stage of the Tapeo Dong 1, and for both stages of the Tapeo Dong 2.
- Since the early 1990s, the focus of reports on Iran's missile efforts have shifted, and it has become clear that Iran is developing its own longer-range variants of the No-Dong for indigenous production with substantial Russian and some Chinese aid:
    - As early as 1992, one such missile was reported to have a range of 800-930 miles and a 1,650 pound warhead. Reports differ sharply on its size. Jane's estimates a launch weight up to 16,000 kilograms, provided the system is derived from the No Dong. It could have a launch weight of 15,000 kilograms, a payload of 600 kilograms, and a range of 1,700-1,800 kilometers if it is based on a system similar to the Chinese CSS-5 (DF-21) and CSS-N3 (JL-1). These systems entered service in 1983 and 1987.
    - A longer-range missile was said to have improved guidance components, a range of up to 1,240 miles and a warhead of up to 2,200 pounds.
    - IOC dates were then estimated to be 1999-2001.
    - Russia agreed in 1994 that it would adhere to the terms of the Missile Technology Control Regime and would place suitable limits on the sale or transfer of rocket engines and technology. Nevertheless, the CIA has identified Russia as a leading source of Iranian missile technology, and the State Department has indicated that President Clinton expressed U.S. concerns over this cooperation to President Yeltsin. This transfer is one reason the President appointed

former Ambassador Frank Wisner, and then Robert Galluci, as his special representatives to try to persuade Russia to put a firm halt to aid support of the Iran.

- These programs are reported to have continuing support from North Korea, and from Russian and Chinese firms and technicians. One such Chinese firm is Great Wall Industries. The Russian firms include the Russian Central Aerohydrodynamic Institute, which has provided Iran's Shahid Hemmat Industrial Group (SHIG) with wind tunnels for missile design, equipment for manufacturing missile models, and the software for testing launch and reentry performance. They may also include Rosvoorouzhenie, a major Russian arms-export agency; NPO Trud, a rocket motor manufacturer; a leading research center called the Bauman Institute, and Polyus (Northstar), a major laser test and manufacturing equipment firm.

- The CIA reported in June 1997 that Iran obtained major new transfers of new long-range missile technology from Russian and Chinese firms during 1996. Since that time, there have been many additional reports of technology transfer from Russia.

- The reports on Chinese technology transfers involve the least detail:

- There have been past reports that Iran placed orders for PRC-made M-9 (CSS-6/DF-15) missile (280-620 kilometers range, launch weight of 6,000 kilograms).

- It is more likely, however, that PRC firms are giving assistance in developing indigenous missile Rpercent D and production facilities for the production of an Iranian solid fueled missile.

- The U.S. offered to provide China with added missile technology if it would agree to fully implement an end of technology transfer to Iran and Pakistan during meetings in Beijing on March 25-26, 1998.

- Recent reports and tests have provided more detail on these systems:

  - Some U.S. experts believe that Iran tested booster engines in 1997 capable of driving a missile ranges of 1,500 kilometers. Virtually all U.S. experts believe that Iran is rapidly approaching the point where it will be able to manufacture missiles with much longer ranges than the Scud B. It is less clear when Iran will be able to bring such

programs to the final development stage, carry out suitable test firings, develop effective warheads, and deploy actual units. Much still depends on the level of foreign assistance.

- Eitan Ben Eliyahu—the commander of the Israeli Air Force—reported on April 14, 1997 that Iran had tested a missile capable of reaching Israel. The background briefings to his statement implied that Russia was assisting Iran in developing two missiles—with ranges of 620 and 780 miles. Follow-on intelligence briefings that Israel provided in September 1997, indicated that Russia was helping Iran develop four missiles. U.S. intelligence reports indicate that China has also been helping Iran with some aspects of these missile efforts.

- These missiles included the Shihab ("meteor") missiles, with performance similar to those previously identified with Iranian missiles adapted from North Korean designs.

- The Israeli reports indicated that the Shihab 3 was a liquid fueled missile with a range of 810 miles (1,200-1,500 kilometers) and a payload of 1550 pounds (700 kilometers).

- Israel has also reported that Iran is developing the Shihab 4, with a range of 1,250 miles (some reports say up to 4,000 kilometers) and a payload in excess of one ton. It indicates that this system could be operational in 2-5 years. U.S. Assistant Secretary for Near East Affairs testified on July 28, 1998, that the U.S. estimated that the system still needed added foreign assistance to improve its motors and guidance system.

- Israeli reports indicated that Iran might have two other missile programs including longer-range systems with a maximum range of up to 4,500-55,000 and 10,000 kilometers.

- Iran tested the Shihab 3 on July 21, 1998, claiming that it was a defensive action to deal with potential threats from Israel.

  - The missile flew for a distance of up to 620 miles, before its exploded about 100 seconds after launch. U.S. intelligence sources could not confirm whether the explosion was deliberate, but indicated that the final system might have a range of 800-940 miles (a maximum of 1,240 kilometers), depending on its payload. The test confirmed the fact the missile was a liquid fueled system.

  - Gen. Mohammad Bagher Qalibaf, head of the Islamic Revolutionary Guards Corps' air wing, publicly reported on

August 2, 1998 that the Shahab-3 is a 53-foot-long ballistic missile that can travel at 4,300 mph and carry a one-ton warhead at an altitude of nearly 820,000 feet. He claimed that the weapon was guided by an Iranian-made system that gives it great accuracy: "The final test of every weapon is in a real war situation but, given its warhead and size, the Shahab-3 is a very accurate weapon."

- Other Iranian sources reported that the missile had a range of 800 miles. President Mohammad Khatami on August 1, 1998 said that Iran was determined to continue to strengthen its armed forces, regardless of international concerns: "Iran will not seek permission from anyone for strengthening its defense capability."

- Martin Indyck, the U.S. Assistant Secretary for Near East Affairs testified on July 28, that the U.S. estimated that the system needed further refinement but might be deployed in its initial operational form between September 1998 and March 1999.

- There have been other reports that Iran might be using Russian technology to develop very long-range missiles with ranges of 3,500 to 6,250 kilometers.

- It seems clear that Iran has obtained some of the technology and design details of the Russian SS-4. The SS-4 (also known as the R-12 or "Sandal") is an aging Russian liquid fuel design that first went into service in 1959, and which was supposedly destroyed as part of the IRBM Treaty. It is a very large missile, with technology dating back to the early 1950s, although it was evidently updated at least twice during the period between 1959 and 1980. It has a CEP of 2-4 kilometers and a maximum range 2,000 kilometers, which means it can only be lethal with a nuclear warhead or a biological weapon with near-nuclear lethality.

- At the same time, the SS-4's overall technology is relatively simple and it has a throwweight of nearly 1,400 kilograms (3,000 pounds). It is one of the few missile designs that a nation with a limited technology base could hope to manufacture or adapt, and its throwweight and range would allow Iran to use a relatively unsophisticated nuclear device or biological warhead. As a result, an updated version of the SS-4 might be a suitable design for a developing country.

- Russia has been a key supplier of missile technology.

- Some sources have indicated that Russian military industries have signed contracts with Iran to help produce liquid fueled missiles and provide specialized wind tunnels, manufacture model missiles, and develop specialized computer software. For example, these reports indicate that the Russian Central Aerohydrodynamic Institute is cooperating with Iran's Defense Industries Organization (DIO) and the DIO's Shahid Hemmat Industrial Group (SHIG). The Russian State Corporation for Export and Import or Armament and Military Equipment (Rosvoorouzhenie) and Infor are also reported to be involved in deals with the SHIG. These deals are also said to include specialized laser equipment, mirrors, tungsten-coast graphite material, and maraging steel for missile development and production. They could play a major role in helping Iran develop long range versions of the Scud B and C, and more accurate variations of a missile similar to the No-Dong.

- The Israeli press reported in August 1997 that Israel had evidence that Iran was receiving Russian support. In September 1997, Israel urged the U.S. to step up its pressure on Iran, and leaked reports indicating that private and state-owned Russian firms had provided gyroscopes, electronic components, wind tunnels, guidance and propulsion systems, and the components needed to build such systems to Iran.

- President Yeltsin and the Russian Foreign Ministry initially categorically denied that such charges were true. Following a meeting with Vice President Gore, President Yeltsin stated on September 26, 1997 that, "We are being accused of supplying Iran with nuclear or ballistic missile technologies. There is nothing further from the truth. I again and again categorically deny such rumors."

- Russia agreed, however, that Ambassador Wisner and Yuri Koptyev, the head of the Russian space program, should jointly examine the U.S. intelligence and draft a report on Russian transfers to Iran. This report reached a very different conclusion from President Yeltsin and concluded that Russia had provided such aid to Iran. Further, on October 1, 1997—roughly a week after Yeltsin issued his denial—the Russian security service issued a statement that it had "thwarted" an Iranian attempt to have parts for liquid fuel rocket motors manufactured in Russia, disguised as gas compressors and pumps.

- Russian firms said to be helping Iran included the Russian Central Aerohydrodynamic Institute which developed a special wind tunnel; Rosvoorouzhenie, a major Russian arms-export agency; Kutznetzov (formerly NPO Trud) a rocket motor manufacturer in Samara; a leading research center called the Bauman National Technical University in Moscow, involved in developing rocket propulsion systems; the Tsagi Research Institute for rocket propulsion development; and the Polyus (Northstar) Research Institute in Moscow, a major laser test and manufacturing equipment firm. Iranians were also found to be studying rocket engineering at the Baltic State University in St. Petersburg and the Bauman State University.

- Russia was also found to have sold Iran high strength steel and special foil for its long-range missile program. The Russian Scientific and Production Center Inor concluded an agreement as late as September 1997 to sell Iran a factory to produce four special metal alloys used in long-range missiles. Inor's director, L. P Chromova, worked out a deal with A. Asgharzadeh, the director of an Iranian factory, to sell 620 kilograms of special alloy called 21HKMT, and provide Iran with the capability to thermally treat the alloy for missile bodies. Iran had previously bought 240 kilograms of the alloy. Inor was also selling alloy foils called 49K2F, CUBE2, and 50N in sheets 0.2-0.4 millimeters thick for the outer body of missiles. The alloy 21HKMT was particularly interesting because North Korea also uses it in missile designs. Inor had previously brokered deals with the Shahid Hemat Industrial Group in Iran to supply maraging steel for missile cases, composite graphite-tungsten material, laser equipment, and special mirrors used in missile tests.

- The result was a new and often tense set of conversations between the U.S. and Russia in January 1998. The U.S. again sent Ambassador Frank Wisner to Moscow, Vice President Gore called Prime Minster Viktor Chernomyrdin, and Secretary of State Madeline Albright made an indirect threat that the Congress might apply sanctions. Sergi Yastrzhembsky, a Kremlin spokesman, initially responded by denying that any transfer of technology had taken place.

- This Russian denial was too categorical to have much credibility. Russia had previously announced the arrest of an Iranian diplomat on November 14, 1997,who it caught attempting to buy missile technology. The Iranian was

seeking to buy blueprints and recruit Russian scientists to go to Iran. Yuri Koptev, the head of the Russian Space Agency, explained this, however, by stating that that, "There have been several cases where some Russian organizations, desperately struggling to make ends meet and lacking responsibility, have embarked on some ambiguous projects...they were stopped long before they got to the point where any technology got out."

- The end result of these talks was an agreement by Gore and Chernomyrdin to strengthen controls over transfer technology, but it was scarcely clear that it put an end to the problem. As Koptev has said, "There have been several cases where some Russian organizations, desperately struggling to make ends meet and lacking responsibility, have embarked on some ambiguous projects." Conditions in Russia are getting worse, not better, and the desperation that drives sales has scarcely diminished.

- Prime Minister Chernomyrdin again promised to strengthen his efforts to restrict technology transfer to Iran in a meeting with Gore on March 12, 1998. The U.S. informed Russia of 13 cases of possible Russian aid to Iran at the meeting and offered to increase the number of Russian commercial satellite launches it would license for U.S. firms as an incentive.

- New arrests of smugglers took place on April 9, 1998. The smugglers had attempted to ship 22 tons of specialized steel to Iran via Azerbaijan, using several Russia shell corporations as a cover.

- On April 16, 1998, the State Department declared 20 Russian agencies and research facilities were ineligible to receive U.S. aid because of their role in transferring missile technology to Iran.

- A U.S. examination of Iran's dispersal, sheltering, and hardening programs for its anti-ship missiles and other missile systems indicates that Iran has developed effective programs to ensure that they would survive a limited number of air strikes and that Iran had reason to believe that the limited number of preemptive strikes Israel could conduct against targets in the lower Gulf could not be effective in denying Iran the capability to deploy its missiles.

- Iran has shorter missile range systems:

- In 1990, Iran bought CSS-8 surface-to-surface missiles (converted SA-2s) from China with ranges of 130-150 kilometers.

- Has Chinese sea and land-based anti-ship cruise missiles. Iran fired 10 such missiles at Kuwait during Iran-Iraq War, hitting one U.S.-flagged tanker.

- Iran has acquired much of the technology necessary build long-range cruise missile systems from China:

  - Such missiles would cost only 10 percent to 25 percent as much as ballistic missiles of similar range, and both the HY-2 Seersucker and CS-802 could be modified relatively quickly for land attacks against area targets.

  - Iran reported in December 1995 that it had already fired a domestically built anti-ship missile called the Saeqe-4 (Thunderbolt) during exercises in the Strait of Hormuz and Gulf of Oman. Other reports indicate that China is helping Iran build copies of the Chinese CS-801/CS-802 and the Chinese FL-2 or F-7 anti-ship cruise missiles. These missiles have relatively limited range. The range of the CS-801 is 8-40 kilometers, the range of the CS-802 is 15-120 kilometers, the maximum range of the F-7 is 30 kilometers, and the maximum range of the FL-10 is 50 kilometers. Even a range of 120 kilometers would barely cover targets in the Southern Gulf from launch points on Iran's Gulf coast. These missiles also have relatively small high explosive warheads. As a result, Iran may well be seeking anti-ship capabilities, rather than platforms for delivering weapons of mass destruction.

  - A platform like the CS-802 might, however, provide enough design data to develop a scaled-up, longer-range cruise missile for other purposes, and the Gulf is a relatively small area where most urban areas and critical facilities are near the coast. Aircraft or ships could launch cruise missiles with chemical or biological warheads from outside the normal defense perimeter of the Southern Gulf states, and it is at least possible that Iran might modify anti-ship missiles with chemical weapons to attack tankers—ships which are too large for most regular anti-ship missiles to be highly lethal.

  - Building an entire cruise missile would be more difficult. The technology for fusing CBW and cluster warheads would be within Iran's grasp. Navigation systems and jet engines, however, would still be a major potential problem. Current

inertial navigation systems (INS) would introduce errors of at least several kilometers at ranges of 1,000 kilometers and would carry a severe risk of total guidance failure—probably exceeding two-thirds of the missiles fired. A differential global positioning system (GPS) integrated with the inertial navigation system (INS) and a radar altimeter, however, might produce an accuracy of 15 meters. Some existing remotely piloted vehicles (RPVs), such as the South African Skua, claim such performance. Commercial technology is becoming available for differential global positioning system (GPS) guidance with accuracies of 2 to 5 meters.

- There are commercially available reciprocating and gas turbine engines that Iran could adapt for use in a cruise missile, although finding a reliable and efficient turbofan engine for a specific design application might be difficult. An extremely efficient engine would have to be matched to a specific airframe. It is doubtful that Iran could design and build such an engine, but there are over 20 other countries with the necessary design and manufacturing skills.

- While airframe-engine-warhead integration and testing would present a challenge and might be beyond Iran's manufacturing skills, it is inherently easier to integrate and test a cruise missile than a long-range ballistic missile. Further, such developments would be far less detectable than developing a ballistic system if the program used coded or low altitude directional telemetry.

- Iran could bypass much of the problems inherent in developing its own cruise missile by modifying the HY-2 Seersucker for use as a land attack weapon and extending its range beyond 80 kilometers, or by modifying and improving the CS-801 (Ying Jai-1) anti-ship missile. There are reports that the Revolutionary Guards are working on such developments at a facility near Bandar Abbas.

- Su-24 long-range strike fighters with range-payloads roughly equivalent to U.S. F-111 and superior to older Soviet medium bombers.

- F-4D/E fighter bombers with capability to carry extensive payloads to ranges of 450 miles.

- Can modify HY-2 Silkworm missiles and SA-2 surface-to-air missiles to deliver weapons of mass destruction.

- Iran has made several indigenous-long range rockets.

- The Iran-130, or Nazeat, since the end of the Iran-Iraq War. The full details of this system remain unclear, but it seems to use commercially available components, a solid fuel rocket, and a simple inertial guidance system to reach ranges of about 90-120 kilometers. It is 355 mm in diameter, 5.9 meters long, weighs 950 kilograms, and has a 150 kilogram warhead. It seems to have poor reliability and accuracy, and its payload only seems to be several hundred kilograms.
- The Shahin 2. It too has a 355 mm diameter, but is only 3.87 meters long, and weighs only 580 kilograms. It evidently can be equipped with three types of warheads: A 180 kilogram high explosive warhead, another warhead using high explosive submunitions, and a warhead that uses chemical weapons.
- Iranian Oghab (Eagle) rocket with 40+ kilometers range.
- New SSM with 125 mile range may be in production, but could be modified FROG.

- Large numbers of multiple rocket launchers and tube artillery for short range delivery of chemical weapons.

Chemical Weapons

- Iran purchased large amounts of chemical defense gear from the mid-1980s onwards. Iran also obtained stocks of non-lethal CS gas, although it quickly found such agents had very limited military impact since they could only be used effectively in closed areas or very small open areas.
- Acquiring poisonous chemical agents was more difficult. Iran did not have any internal capacity to manufacture poisonous chemical agents when Iraq first launched its attacks with such weapons. While Iran seems to have made limited use of chemical mortar and artillery rounds as early as 1985—and possibly as early as 1984—these rounds were almost certainly captured from Iraq.
- Iran had to covertly import the necessary equipment and supplies, and it took several years to get substantial amounts of production equipment, and the necessary feedstocks. Iran sought aid from European firms like Lurgi to produce large "pesticide" plants, and began to try to obtain the needed feedstock from a wide range of sources, relying heavily on its Embassy in Bonn to manage the necessary deals. While Lurgi did not provide the pesticide plant Iran sought, Iran did obtain

substantial support from other European firms and feedstocks from many other Western sources.

- By 1986-1987, Iran developed the capability to produce enough lethal agents to load its own weapons. The Director of the CIA, and informed observers in the Gulf, made it clear that Iran could produce blood agents like hydrogen cyanide, phosgene gas, and/or chlorine gas. Iran was also able to weaponize limited quantities of blister (sulfur mustard) and blood (cyanide) agents beginning in 1987, and had some capability to weaponize phosgene gas, and/or chlorine gas. These chemical agents were produced in small batches, and evidently under laboratory scale conditions, which enabled Iran to load small numbers of weapons before any of its new major production plants went into full operation.
- These gas agents were loaded into bombs and artillery shells, and were used sporadically against Iraq in 1987 and 1988.
- Reports regarding Iran's production and research facilities are highly uncertain:
    - Iran seems to have completed production of a major poison gas plant at Qazvin, about 150 kilometers west of Tehran. This plant is reported to have been completed between November 1987 and January 1988. While supposedly a pesticide plant, the facility's true purpose seems to have been poison gas production using organophosphorous compounds.
    - It is impossible to trace all the sources of the major components and technology Iran used in its chemical weapons program during this period. Mujahideen sources claim Iran also set up a chemical bomb and warhead plant operated by the Zakaria Al-Razi chemical company near Mahshar in southern Iran, but it is unclear whether these reports are true.
    - Reports that Iran had chemical weapons plants at Damghan and Parchin that began operation as early as March 1988, and may have begun to test fire Scuds with chemical warheads as early as 1988-1989, are equally uncertain.
    - Iran established at least one large research and development center under the control of the Engineering Research Centre of the Construction Crusade (Jahad e-Sazandegi), and had established a significant chemical weapons production capability by mid-1989.

- Debates took place in the Iranian parliament or Majlis in late 1988 over the safety of Pasdaran gas plants located near Iranian towns, and that Rafsanjani described chemical weapons as follows: "Chemical and biological weapons are poor man's atomic bombs and can easily be produced. We should at least consider them for our defense. Although the use of such weapons is inhuman, the war taught us that international laws are only scraps of paper."
- Post Iran-Iraq War estimates of Iran chemical weapons production are extremely uncertain:
    - U.S. experts believe Iran was beginning to produce significant mustard gas and nerve gas by the time of the August 1988 cease-fire in the Iran-Iraq War, although its use of chemical weapons remained limited and had little impact on the fighting
    - Iran's efforts to equip plants to produce V-agent nerve gases seem to have been delayed by U.S., British, and German efforts to limit technology transfers to Iran, but Iran may have acquired the capability to produce persistent nerve gas during the mid 1990s.
    - Production of nerve gas weapons started no later than 1994.
    - Began to stockpile of cyanide (cyanogen chloride), phosgene, and mustard gas weapons after 1985. Recent CIA testimony indicates that production capacity may approach 1,000 tons annually.
- Weapons include bombs and artillery. Shells include 155 mm artillery and mortar rounds. Iran also has chemical bombs and mines. It may have developmental chemical warheads for its Scuds, and may have a chemical package for its 22006 RPV (doubtful).
- There are reports that Iran has deployed chemical weapons on some of its ships.
- Iran has increased chemical defensive and offensive warfare training since 1993.
- Iran is seeking to buy more advanced chemical defense equipment, and has sought to buy specialized equipment on the world market to develop indigenous capability to produce advanced feedstocks for nerve weapons.

- CIA sources indicated, in late 1996, that China might have supplied Iran with up to 400 tons of chemicals for the production of nerve gas.
- One report indicated, in 1996, that Iran obtained 400 metric tons of chemicals for use in nerve gas weapons from China—including carbon sulfide.
- Another report indicated that China supplied Iran with roughly two tons of calcium- hypochlorate in 1996, and loaded another 40,000 barrels in January or February of 1997. Calcium-hypochlorate is used for decontamina- tion in chemical warfare.
- Iran placed several significant orders from China that were not delivered. Razak Industries in Tehran, and Chemical and Pharmaceutical Industries in Tabriz ordered 49 metric tons of alkyl dimethylamine, a chemical used in making detergents, and 17 tons of sodium sulfide, a chemical used in making mustard gas. The orders were never delivered, but they were brokered by Iran's International Movalled Industries Corporation (Imaco) and China's North Chemical Industries Co. (Nocinco). Both brokers have been linked to other transactions affecting Iran's chemical weapons program since early 1995, and Nocinco has supplied Iran with several hundred tons of carbon disulfide, a chemical used in nerve gas.
- Another Chinese firm, only publicly identified as Q. Chen, seems to have supplied glass vessels for chemical weapons.
- The U.S. imposed sanctions on seven Chinese firms in May 1997 for selling precursors for nerve gas and equipment for making nerve gas—although the U.S. made it clear that it had, "no evidence that the Chinese government was involved." The Chinese firms were the Nanjing Chemical Industries Group and Jiangsu Yongli Chemical Engineering and Import/Export Corporation. Cheong Yee Ltd., a Hong Kong firm, was also involved. The precursors included tionyl chloride, dimethylamine, and ethylene chlorohydril. The equipment included special glass lined vessels, and Nanjing Chemical and Industrial Group completed construction of a production plant to manufacture such vessels in Iran in June 1997.
- Iran sought to obtain impregnated Alumina, which is used to make phosphorous-oxychloride— a major component of VX and GB—from the U.S.

- It has obtained some equipment from Israelis. Nahum Manbar, an Israeli national living in France, was convicted in an Israeli court in May 1997 for providing Iran with $16 million worth of production equipment for mustard and nerve gas during the period from 1990 to 1995.
- CIA reported in June 1997 that Iran had obtained new chemical weapons equipment technology from China and India in 1996.
- India is assisting in the construction of a major new plant at Qazvim, near Tehran, to manufacture phosphorous pentasulfide, a major precursor for nerve gas. The plant is fronted by Meli Agrochemicals, and the program was negotiated by Dr. Mejid Tehrani Abbaspour, a chief security advisor to Rafsanjani.
- A recent report by German intelligence indicates that Iran has made major efforts to acquire the equipment necessary to produce Sarin and Tabun, using the same cover of purchasing equipment for pesticide plants that Iraq used for its Sa'ad 16 plant in the 1980s. German sources note that three Indian companies—Tata Consulting Engineering, Transpek, and Rallis India—have approached German pharmaceutical and engineering concerns for such equipment and technology under conditions where German intelligence was able to trace the end user to Iran.

- Iran ratified the Chemical Weapons Convention in June 1997.
  - It submitted a statement in Farsi to the CWC secretariat in 1998, but this consisted only of questions in Farsi as to the nature of the required compliance.
  - It has not provided the CWC with any data on its chemical weapons program.

Biological Weapons

- Extensive laboratory and research capability.
- Weapons effort documented as early as 1982. Reports surfaced that Iran had imported suitable type cultures from Europe and was working on the production of Mycotoxins—a relatively simple family of biological agents that require only limited laboratory facilities for small scale production.
- U.S. intelligence sources reported in August 1989 that Iran was trying to buy two new strains of fungus from Canada and the Netherlands that can be used to produce Mycotoxins. German

sources indicated that Iran had successfully purchased such cultures several years earlier.

- The Imam Reza Medical Center at Mashhad Medical Sciences University and the Iranian Research Organization for Science and Technology were identified as the end users for this purchasing effort, but it is likely that the true end user was an Iranian government agency specializing in biological warfare.
- Many experts believe that the Iranian biological weapons effort was placed under the control of the Islamic Revolutionary Guards Corps, which is known to have tried to purchase suitable production equipment for such weapons.
- Since the Iran-Iraq War, Iran has conducted research on more lethal active agents like Anthrax, hoof and mouth disease, and biotoxins. In addition, Iranian groups have repeatedly approached various European firms for the equipment and technology necessary to work with these diseases and toxins.
    - Unclassified sources of uncertain reliability have identified a facility at Damghan as working on both biological and chemical weapons research and production, and believe that Iran may be producing biological weapons at a pesticide facility near Tehran.
    - Some universities and research centers may be linked to biological weapons program.
    - Reports surfaced in the spring of 1993 that Iran had succeeded in obtaining advanced biological weapons technology in Switzerland and containment equipment and technology from Germany. According to these reports, this led to serious damage to computer facilities in a Swiss biological research facility by unidentified agents. Similar reports indicated that agents had destroyed German bio-containment equipment destined for Iran.
    - More credible reports by U.S. experts indicate that Iran has begun to stockpile anthrax and botulinum in a facility near Tabriz, can now mass manufacture such agents, and has them in an aerosol form. None of these reports, however, can be verified.
    - The CIA has reported that Iran has, “sought dual-use biotech equipment from Europe and Asia, ostensibly for civilian use.” It also reported in 1996 that Iran might be ready to deploy biological weapons. Beyond this point, little unclassified information exists regarding the details of Iran’s effort to “weaponize” and produce biological weapons.

- Iran may have the production technology to make dry storable and aerosol weapons. This would allow it to develop suitable missile warheads and bombs and covert devices.
- Iran may have begun active weapons production in 1996, but probably only at limited scale suitable for advanced testing and development.
- CIA testimony indicates that Iran is believed to have weaponized both live agents and toxins for artillery and bombs and may be pursuing biological warheads for its missiles. The CIA reported in 1996 that, "We believe that Iran holds some stocks of biological agents and weapons. Tehran probably has investigated both toxins and live organisms as biological warfare agents. Iran has the technical infrastructure to support a significant biological weapons program with little foreign assistance.
- CIA reported in June 1997 that Iran had obtained new dual-use technology from China and India during 1996.
- Iran announced in June 1997 that it would not produce or employ chemical weapons, including toxins.

Nuclear Weapons

- The Shah established the Atomic Energy Organization of Iran in 1974, and rapidly began to negotiate for nuclear power plants.
    - He concluded an extendible ten year nuclear fuel contract with the U.S. in 1974, with Germany in 1976, and France in 1977.
    - In 1975, he purchased a 10 percent share in a Eurodif uranium enrichment plant being built at Tricastin in France that was part of a French, Belgian, Spanish, and Italian consortium. Under the agreement the Shah signed, Iran was to have full access to the enrichment technology Eurodif developed, and agreed to buy a quota of enriched uranium from the new plant.
    - He created an ambitious plan calling for a network of 23 power reactors throughout Iran that was to be operating by the mid-1990s, and sought to buy nuclear power plants from Germany and France.
    - By the time the Shah fell in January 1979, he had six reactors under contract, and was attempting to purchase a total of 12 nuclear power plants from Germany, France, and the U.S.. Two 1,300 megawatt German nuclear power plants at Bushehr were already 60 percent and 75 percent

completed, and site preparation work had begun on the first of two 935 megawatt French plants at Darkhouin that were to be supplied by Framatome.

- The Shah also started a nuclear weapons program in the early to mid-1970s, building upon his major reactor projects, investment in URENCO, and smuggling of nuclear enrichment and weapons related technology from U.S. and Europe.
    - 5 megawatt light-water research reactor operating in Tehran.
    - 27 kilowatt neutron-source reactor operating in Isfahan.
    - Started two massive 1300 megawatt reactor complexes.
    - The Shah attempted to covertly import controlled technology from the U.S.
- U.S. experts believe that the Shah began a low-level nuclear weapons research program, centered at the Amirabad Nuclear Research Center. This research effort included studies of weapons designs and plutonium recovery from spent reactor fuel.
    - It also involved a laser enrichment program which began in 1975, and led to a complex and highly illegal effort to obtain laser separation technology from the U.S.. This latter effort, which does not seem to have had any success, continued from 1976 until the Shah's fall, and four lasers operating in the critical 16 micron band were shipped to Iran in October 1978.
    - At the same time, Iran worked on other ways to obtain plutonium, created a secret reprocessing research effort to use enriched uranium, and set up a small nuclear weapons design team.
    - In 1976, Iran signed a secret contract to buy $700 million worth of yellow cake from South Africa, and appears to have reached an agreement to buy up to 1,000 metric tons a year. It is unclear how much of this ore South Africa shipped before it agreed to adopt IAEA export restrictions in 1984, and whether South Africa really honored such export restrictions. Some sources indicate that South Africa still made major deliveries as late as 1988-1989.
    - Iran also tried to purchase 26.2 kilograms of highly enriched uranium; the application to the U.S. for this purchase was pending when the Shah fell.

- The Shah did eventually accept full IAEA safeguards but their value is uncertain.

- In 1984, Khomeini revived nuclear weapons program begun under Shah.
  - Received significant West German and Argentine corporate support in some aspects of nuclear technology during the Iran-Iraq War.
  - Limited transfers of centrifuge and other weapons related technology from PRC, possibly Pakistan.
  - It has a Chinese-supplied heavy-water, zero-power research reactor at Isfahan Nuclear Research Center, and two-Chinese supplied sub-critical assemblies—a light water and graphite design.
  - It has stockpiles of uranium and mines in Yazd area. It may have had a uranium-ore concentration facility at University of Tehran, but status is unclear.
  - Some experts feel that the IRGC moved experts and equipment from the Amirabad Nuclear Research Center to a new nuclear weapons research facility near Isfahan in the mid-1980s, and formed a new nuclear research center at the University of Isfahan in 1984—with French assistance. Unlike many Iranian facilities, the center at Isfahan was not declared to the IAEA until February 1992, when the IAEA was allowed to make a cursory inspection of six sites that various reports had claimed were the location of Iran's nuclear weapons efforts.
  - Bushehr I and II, on the Gulf Coast just southwest of Isfahan, were partially completed at the time of the Shah's fall. Iran attempted to revive the program and sought German and Argentine support, but the reactors were damaged by Iraqi air strikes in 1987 and 1988.
  - Iran may also have opened a new uranium ore processing plant close to its Shagand uranium mine in March 1990, and it seems to have extended its search for uranium ore into three additional areas. Iran may have also begun to exploit stocks of yellow cake that the Shah had obtained from South Africa in the late 1970s while obtaining uranium dioxide from Argentina by purchasing it through Algeria.
  - Iran began to show a renewed interest in laser isotope separation (LIS) in the mid-1980s, and held a conference on LIS in September 1987.

- Iran opened a new nuclear research center in Isfahan in 1984, located about four kilometers outside the city and between the villages of Shahrida and Fulashans. This facility was built at a scale far beyond the needs of peaceful research, and Iran sought French and Pakistani help for a new research reactor for this center.

- The Khomeini government may also have obtained several thousand pounds of uranium dioxide from Argentina by purchasing it through Algeria. Uranium dioxide is considerably more refined than yellow cake, and is easier to use in irradiating material in a reactor to produce plutonium.

- The status of Iran's nuclear program since the Iran-Iraq War is highly controversial, and Iran has denied the existence of such a program.

  - On February 7, 1990, the speaker of the Majlis publicly toured the Atomic Energy Organization of Iran and opened the new Jabir Ibn al Hayyan laboratory to train Iranian nuclear technicians. Reports then surfaced that Iran had at least 200 scientists and a work force of about 2,000 devoted to nuclear research.

  - Iran's Deputy President Ayatollah Mohajerani stated in October 1991 that Iran should work with other Islamic states to create an "Islamic bomb."

  - The Iranian government has repeatedly made proposals to create a nuclear-free zone in the Middle East. For example, President Rafsanjani was asked if Iran had a nuclear weapons program in an interview in the CBS program 60 Minutes in February 1997. He replied, "Definitely not. I hate this weapon."

  - Other senior Iranian leaders, including President Khatami, have made similar categorical denials. Iran's new Foreign Minister, Kamal Kharrazi, stated on October 5, 1997, that, "We are certainly not developing an atomic bomb, because we do not believe in nuclear weapons... We believe in and promote the idea of the Middle East as a region free of nuclear weapons and other weapons of mass destruction. But why are we interested to develop nuclear technology? We need to diversify our energy sources. In a matter of a few decades, our oil and gas reserves would be finished and therefore, we need access to other sources of energy . . . Furthermore, nuclear technology has many other utilities in medicine and agriculture. The case of the United States

in terms of oil reserve is not different from Iran's. The United States also has large oil resources, but at the same time they have nuclear power plants. So there is nothing wrong with having access to nuclear technology if it is for peaceful purposes . . ."

- The IAEA reports that Iran has fully complied with its present requirements, and that it has found no indications of nuclear weapons effort, but IAEA only inspects Iran's small research reactors.
    - The IAEA visits to other Iranian sites are not inspections, and do not use instruments, cameras, seals, etc. The are informal walkthroughs.
    - The IAEA visited five suspect Iranian facilities in 1992 and 1993 in this manner, but did not conduct full inspections.
    - Iran has not had any 93+2 inspections and its position on improved inspections is that it will not be either the first or the last to have them.
    - Iranian officials have repeatedly complained that the West tolerated Iraqi use of chemical weapons and its nuclear and biological build-up during the Iran-Iraq War, and has a dual standard where it does not demand inspections of Israel or that Israel sign the NPT.
- These are reasons to assume that Iran still has a nuclear program:
    - Iran attempted to buy highly enriched fissile material from Khazakstan. The U.S. paid between $20 million and $30 million to buy 1,300 pounds of highly enriched uranium from the Ust-Kamenogorsk facility in Khazakstan that Iran may have sought to acquire in 1992. A total of 120 pounds of the material—enough for two bombs—cannot be fully accounted for.
    - Iran has imported maraging steel, sometimes used for centrifuges, by smuggling it in through dummy fronts. Britain intercepted 110 pound (50 kilo) shipment in August 1996. Seems to have centrifuge research program at Sharif University of Technology in Tehran. IAEA "visit" did not confirm.
    - Those aspects of Iran's program that are visible indicate that Iran has had only uncertain success. Argentina agreed to train Iranian technicians at its Jose Balaseiro Nuclear Institute, and sold Iran $5.5 million worth of uranium for its

small Amirabad Nuclear Research Center reactor in May 1987. A CENA team visited Iran in late 1987 and early 1988, and seems to have discussed selling Iran the technology necessary to operate its reactor with 20 percent enriched uranium as a substitute for the highly enriched core provided by the U.S., and possibly uranium enrichment and plutonium reprocessing technology as well. Changes in Argentina's government, however, made it much less willing to support proliferation. The Argentine government announced in February 1992 that it was canceling an $18 million nuclear technology sale to Iran because it had not signed a nuclear safeguards arrangement. Argentine press sources suggested, however, that Argentina was reacting to U.S. pressure.

- In February 1990, a Spanish paper reported that Associated Enterprises of Spain was negotiating the completion of the two nuclear power plants at Bushehr. Another Spanish firm called ENUSA (National Uranium Enterprises) was to provide the fuel, and Kraftwerke Union (KWU) would be involved. Later reports indicated that a 10 man delegation from Iran's Ministry of Industry was in Madrid negotiating with the Director of Associated Enterprises, Adolofo Garcia Rodriguez.

- Iran negotiated with Kraftwerke Union and CENA of Germany in the late 1980s and early 1990s. Iran attempted to import reactor parts from Siemens in Germany and Skoda in Czechoslovakia. None of these efforts solved Iran's problems in rebuilding its reactor program, but all demonstrate the depth of its interest.

- Iran took other measures to strengthen its nuclear program during the early 1990s. It installed a cyclotron from Ion Beam Applications in Belgium at a facility in Karzaj in 1991.

- Iran conducted experiments in uranium enrichment and centrifuge technology at its Sharif University of Technology in Tehran. Sharif University was also linked to efforts to import cylinders of fluorine suitable for processing enriched material, and attempts to import specialized magnets that can be used for centrifuges, from Thyssen in Germany in 1991.

- It is clear from Iran's imports that it has sought centrifuge technology ever since. Although many of Iran's efforts have never been made public, British customs officials

seized 110 pounds of maraging steel being shipped to Iran in July 1996.

- Iran seems to have conducted research into plutonium separation and Iranians published research on uses of tritium that had applications to nuclear weapons boosting. Iran also obtained a wide range of U.S. and other nuclear literature with applications for weapons designs. Italian inspectors seized eight steam condensers bound for Iran that could be used in a covert reactor program in 1993, and high technology ultrasound equipment suitable for reactor testing at the port of Bari in January 1994.

- Other aspects of Iran's nuclear research effort had potential weapons applications. Iran continued to operate an Argentine-fueled five megawatt light water highly enriched uranium reactor at the University of Tehran. It is operated by a Chinese-supplied neutron source research reactor, and subcritical assemblies with 900 grams of highly enriched uranium, at its Isfahan Nuclear Research Center. This Center has experimented with a heavy water zero-power reactor, a light water sub-critical reactor, and a graphite sub-critical reactor. In addition, it may have experimented with some aspects of nuclear weapons design.

- The German Ministry of Economics has circulated a wide list of such Iranian fronts which are known to have imported or attempted to import controlled items. These fronts include the:

    - Bonyad e-Mostazafan;

    - Defense Industries Organization (Sazemane Sanaye Defa);

    - Pars Garma Company, the Sadadja Industrial Group (Sadadja Sanaye Daryaee);

    - Iran Telecommunications Industry (Sanaye Mokhaberet Iran);

    - Shahid Hemat Industrial Group, the State Purchasing Organization, Education Research Institute (ERI);

    - Iran Aircraft Manufacturing Industries (IAI);

    - Iran Fair Deal Company, Iran Group of Surveyors;

    - Iran Helicopter Support and Renewal Industries (IHI);

- Iran Navy Technical Supply Center;
- Iran Tehran Kohakd Daftar Nezarat, Industrial Development Group;
- Ministry of Defense (Vezerate Defa).

- Iran claims it eventually needs to build enough nuclear reactors to provide 20 percent of its electric power. This Iranian nuclear power program presents serious problems in terms of proliferation. Although the reactors are scarcely ideal for irradiating material to produce Plutonium or cannibalizing the core, they do provide Iran with the technology base to make its own reactors, have involved other technology transfer helpful to Iran in proliferating and can be used to produce weapons if Iran rejects IAEA safeguards.
- Russia has agreed to build up to four reactors, beginning with a complex at Bushehr—with two 1,000-1,200 megawatt reactors and two 465 megawatt reactors, and provide significant nuclear technology.
  - Russia has consistently claimed the light water reactor designs for Bushehr cannot be used to produce weapons grade Plutonium and are similar to the reactors the U.S. is providing to North Korea.
  - The U.S. has claimed, however, that Victor Mikhaliov, the head of Russia's Atomic Energy Ministry, proposed the sale of a centrifuge plant in April 1995. The U.S. also indicated that it had persuaded Russia not to sell Iran centrifuge technology as part of the reactor deal during the summit meeting between Presidents Clinton and Yeltsin in May 1995.
  - It was only after U.S. pressure that Russia publicly stated that it never planned to sell centrifuge and advanced enrichment technology to Iran, and Iran denied that it had ever been interested in such technology. For example, the statement of Mohammed Sadegh Ayatollahi, Iran's representative to the IAEA, stated that, "We've had contracts before for the Bushehr plant in which we agreed that the spent fuel would go back to the supplier. For our contract with the Russians and Chinese, it is the same." According to some reports, Russia was to reprocess the fuel at its Mayak plant near Chelyabinsk in the Urals, and could store it at an existing facility, at Krasnoyarsk-26 in southern Siberia.

- The CIA reported in June 1997 that Iran had obtained new nuclear technology from Russia during 1996.
- A nuclear accident at the plant at Rasht, six miles north of Gilan, exposed about 50 people to radiation in July 1996.
- Russian Nuclear Energy Minister Yevgeny Adamov and Russian Deputy Prime Minister Vladimir Bulgak visited in March 1998, and Iran dismissed U.S. complaints about the risk the reactors would be used to proliferate.
    - Russia indicated that it would go ahead with selling two more reactors for construction at Bushehr within the next five years.
    - The first 1,000 megawatt reactor at Bushehr has experienced serious construction delays. In March 1998, Russia and Iran agreed to turn the construction project into a turn key plant because the Iranian firms working on infrastructure had fallen well behind schedule. In February, Iran had agreed to fund improved safety systems. The reactor is reported to be on a 30 month completion cycle.
- The U.S. persuaded the Ukraine not to sell Iran $45 million worth of turbines for its nuclear plant in early March 1998, and to strengthen its controls on Ukrainian missile technology under the MTCR.

- China is reported to have agreed to provide significant nuclear technology transfer and possible sale of two 300 megawatt pressurized water reactors in the early 1990s, but then to have agreed to halt nuclear assistance to Iran after pressure from the U.S..
    - Iran signed an agreement with China's Commission on Science, Technology, and Industry for National Defense on January 21, 1991, to build a small 27-kilowatt research reactor at Iran's nuclear weapons research facility at Isfahan. On November 4, 1991, China stated that it had signed commercial cooperation agreements with Iran in 1989 and 1991, and that it would transfer an electromagnetic isotope separator (Calutron) and a smaller nuclear reactor, for "peaceful and commercial" purposes.
    - The Chinese reactor and Calutron were small research-scale systems and had no direct value in producing fissile material. They did, however, give Iran more knowledge of reactor and enrichment technology, and U.S.

experts believe that China provided Iran with additional data on chemical separation, other enrichment technology, the design for facilities to convert uranium to uranium hexaflouride to make reactor fuel, and help in processing yellowcake.

- The U.S. put intense pressure on China to halt such transfers. President Clinton and Chinese President Jiang Zemin reached an agreement at an October 1997 summit. China strengthened this pledge in negations with the U.S. in February 1998.
- In March 1998 the U.S. found that the China Nuclear Energy Corporation was negotiating to sell Iran several hundred tons of anhydrous hydrogen fluoride (AHF) to Isfahan Nuclear Research Corporation in central Iran, a site where some experts believe Iran is working on the development of nuclear weapons. AHF can be used to separate plutonium, help refine yellow cake into uranium hexaflouride to produce U-235, and as a feedstock for Sarin. It is on two nuclear control lists. China agreed to halt the sale.
- Iran denied that China had halted nuclear cooperation on March 15, 1998.
- Even so, the U.S. acting Under Secretary of State for Arms Control and International Security Affairs stated that China was keeping its pledge not to aid Iran on March 26, 1998.

- U.S. estimates of Iran's progress in acquiring nuclear weapons have become more conservative with time.
  - In 1992, the CIA estimated that Iran would have the bomb by the year 2000. In 1995, John Holum testified that Iran could have the bomb by 2003.
  - In 1997, after two years in which Iran might have made progress, he testified that Iran could have the bomb by 2005-2007.
  - U.S. experts increasingly refer to Iran's efforts as "creeping proliferation." There is no way to tell when or if Iranian current efforts will produce a weapon, and unclassified lists of potential facilities have little credibility.
  - Timing of weapons acquisition depends heavily on whether Iran can buy fissile material—if so it has the design capability and can produce weapons in 1-2 years—or must

develop the capability to process Plutonium or enrich Uranium—in which case, it is likely to be 5-10 years.

- The control of fissile material in the FSU remains a major problem:
    - U.S. estimates indicate the FSU left a legacy of some 1,485 tons of nuclear material. This includes 770 tons in some 27,000 weapons, including 816 strategic bombs, 5,434 missile warheads, and about 20,000 theater and tactical weapons. In addition, there were 715 tons of fissile or near-fissile material in eight countries of the FSU in over 50 sites: enough to make 35,000-40,000 bombs.
    - There are large numbers of experienced FSU technicians, including those at the Russian weapons design center at Arzamas, and at nuclear production complexes at Chelyabinsk, Krasnoyarsk, and Tomsk.
    - These factors led the U.S. to conduct Operation Sapphire in 1994, where the U.S. removed 600 kilograms of highly enriched uranium from the Ulba Metallurgy Plant in Kazakhstan at a time Iran was negotiating for the material.
    - They also led to Britain and the U.S. cooperating in Auburn Endeavor, and airlifting fissile material out of a nuclear research facility in Tiblisi, Georgia. There were 10 pounds of material at the institute, and 8.8 pounds were HEU. (It takes about 35 pounds to make a bomb.) This operation was reported in the *New York Times* on April 21, 1998. The British government confirmed it took place, but would not give the date.
- The *Jerusalem Post* reported on April 9, 1998 that Iran had purchased four tactical nuclear weapons from Russian smugglers for $25 million in the early 1990s, that the weapons had been obtained from Kazakhstan in 1991, and that Argentine technicians were helping to activate the weapon.
    - It quoted what it claimed was an Iranian report, dated December 26, 1991, of a meeting between Brigadier General Rahim Safavi, the Deputy Commander of the Revolutionary Guards and Reza Amrohalli, then head of the Iranian atomic energy organization.
    - It also quoted a second document—dated January 2, 1992 —- saying the Iranians were awaiting the arrival of Russian technicians to show them how to disarm the protection systems that would otherwise inactivate the weapons if anyone attempted to use them.

- The documents implied the weapons were flawed but did not indicate whether Iran had succeeded in activating them.
- The U.S. intelligence community denied any evidence that such a transfer had taken place.
- The most detailed reports of Iran's nuclear weapons program are the least reliable and come from the People's Mujahideen, a violent, anti-regime, terrorist group. Its claims are very doubtful, but the People's Mujahideen has reported that:
    - Iran's facilities include a weapons site called Ma'allem Kelayah, near Qazvin on the Caspian. This is said to be an IRGC-run facility established in 1987, which has involved an Iranian investment of $300 million. Supposedly, the site was to house the 10 megawatt reactor Iran tried to buy from India.
    - Two Soviet reactors were to be installed at a large site at Gorgan on the Caspian, under the direction of Russian physicists.
    - The People's Republic of China provided uranium enrichment equipment and technicians for the site at Darkhouin, where Iran once planned to build a French reactor.
    - A nuclear reactor was being constructed at Karaj; and that another nuclear weapons facility exists in the south central part of Iran, near the Iraqi border.
    - The ammonia and urea plant that the British firm M. W. Kellog was building at Borujerd in Khorassan province, near the border with Turkestan, might be adapted to produce heavy water.
    - The Amir Kabar Technical University, the Atomic Energy Organization of Iran (AEOI) (also known as the Organization for Atomic Energy of Iran or AEOI), Dor Argham Ltd., the Education and Research Institute, GAM Iranian Communications, Ghoods Research Center, Iran Argham Co., Iran Electronic Industries, Iranian Research Organization, Ministry of Sepah, Research and Development Group, Sezemane Sanaye Defa, the Sharif University of Technology, Taradis Iran Computer Company, and Zakaria Al-Razi Chemical

Company are all participants in the Iranian nuclear weapons effort.

- Other sources based on opposition data have listed the Atomic Energy Organization of Iran, the Laser Research Center and Ibn-e Heysam Research and Laboratory Complex, the Bonab Atomic Energy Research Center (East Azerbaijan), the Imam Hussein University of the Revolutionary Guards, the Jabit bin al-Hayyan Laboratory, the Khoshomi uranium mine (Yazd), a possible site at Moallem Kalayeh, the Nuclear Research Center at Tehran University, the Nuclear Research Center for Agriculture and Medicine (Karaj), the Nuclear Research Center of Technology (Isfahan), the Saghand Uranium mine (Yazd), the Sharif University (Tehran) and its Physics Research Center.

Missile Defenses

- Seeking Russian S-300 surface-to-air missile system with limited anti-tactical ballistic missile capability.

Iraq's Search for Weapons of Mass Destruction.

Delivery Systems

- Prior to the Gulf War, Iraq had extensive delivery systems incorporating long-range strike aircraft with refueling capabilities and several hundred regular and improved, longer-range Scud missiles, some with chemical warheads. These systems included:
  - Tu-16 and Tu-22 bombers.
  - MiG-29 fighters.
  - Mirage F-1, MiG-23BM, and Su-22 fighter attack aircraft.
  - A Scud force with a minimum of 819 missiles.
  - Extended range Al Husayn Scud variants (600 kilometer range) extensively deployed throughout Iraq, and at three fixed sites in northern, western, and southern Iraq.
  - Developing Al-Abbas missiles (900 kilometer range), which could reach targets in Iran, the Persian Gulf, Israel, Turkey, and Cyprus.
  - Long-range super guns with ranges of up to 600 kilometers.
- Iraq also engaged in efforts aimed at developing the Tamuz liquid fueled missile with a range of over 2,000 kilometers, and a

solid fueled missile with a similar range. Clear evidence indicates that at least one design was to have a nuclear warhead.

- Iraq attempted to conceal a plant making missile engines from the U.N. inspectors. It only admitted this plant existed in 1995, raising new questions about how many of its missiles have been destroyed.
- Iraq had design work underway for a nuclear warhead for its long-range missiles.
- The Gulf War deprived Iraq of some of its MiG-29s, Mirage F-1s, MiG-23BMs, and Su-22s.
- Since the end of the war, the U.N. inspection regime has also destroyed many of Iraq's long-range missiles:
  - UNSCOM has directly supervised the destruction of 48 Scud-type missiles.
  - It has verified the Iraqi unilateral destruction of 83 more missiles and 9 mobile launchers.
- The U.N. still estimates, however, that it is able to account for 817 of the 819 long-range missiles that Iraq imported in the period ending in 1988:
  - Pre-1980 expenditures, such as training 8
  - Expenditures during the Iran-Iraq War (1980-1981), including the war of the cities in February-April 1988 516
  - Testing activities for the development of Iraq's modifications of imported missiles and other experimentalactivities (1985-1990) 69
  - Expenditures during the Gulf War (January-March 1991) 93
  - Destruction under the supervision of UNSCOM 48
  - Unilateral destruction by Iraq (mid-July and October 1991) 83
  - UNSCOM's analysis has shown that Iraq had destroyed 83 of the 85 missiles it had claimed were destroyed. At the same time, it stated that Iraq had not given an adequate account of its proscribed missile assets, including launchers, warheads, and propellants.

- UNSCOM also reports that it supervised the destruction of 10 mobile launchers, 30 chemical warheads, and 18 conventional warheads.

- Iraq maintains a significant delivery capability consisting of:
  - HY-2, SS-N-2, and C-601 cruise missiles, which are unaffected by U.N. cease-fire terms.
  - FROG-7 rockets with 70 kilometer ranges, also allowed under U.N. resolutions.
  - Multiple rocket launchers and tube artillery.
  - Experimental conversions such as the SA-2.
- Iraq claims to have manufactured only 80 missile assemblies, 53 of which were unusable. UNSCOM claims that 10 are unaccounted for.
  - U.S. experts believe Iraq may still have components for several dozen extended-range Scud missiles.
- In addition, Iraq has admitted to:
  - Hiding its capability to manufacture its own Scuds.
  - Developing an extended range variant of the FROG-7 called the Laith. The U.N. claims to have tagged all existing FROG-7s to prevent any extension of their range beyond the U.N. imposed limit of 150 kilometers for Iraqi missiles.
  - Experimenting with cruise missile technology and ballistic missile designs with ranges up to 3,000 kilometers.
  - Flight testing Al Husayn missiles with chemical warheads in April 1990.
  - Developing biological warheads for the Al Husayn missile as part of Project 144 at Taji.
  - Initiating a research and development program for a nuclear warhead missile delivery system.
  - Successfully developing and testing a warhead separation system.
  - Indigenously developing, testing, and manufacturing advanced rocket engines to include liquid-propellant designs.

- Conducting research into the development of Remotely Piloted Vehicles (RPVs) for the dissemination of biological agents.
- Attempting to expand its Ababil-100 program designed to build surface-to-surface missiles with ranges beyond the permitted 100-150 kilometers.
- Importing parts from Britain, Switzerland, and other countries for a 350 mm "super gun," as well as starting an indigenous 600 mm supergun design effort.

- Iraq initially claimed that it had 45 missile warheads filled with chemical weapons in 1992. It then stated that it had 20 chemical and 25 biological warheads in 1995. UNSCOM established that it had a minimum of 75 operational warheads and 5 used for trials. It has evidence of the existence of additional warheads. It can only verify that 16 warheads were filled with Sarin, and 34 with chemical warfare binary components, and that 30 were destroyed under its supervision—16 with Sarin and 14 with binary components.
- U.S. and U.N. officials conclude further that:
  - Iraq is trying to rebuild its ballistic missile program using a clandestine network of front companies to obtain the necessary materials and technology from European and Russian firms.
  - This equipment is then concealed and stockpiled for assembly concomitant with the end of the UN inspection regime.
  - The equipment clandestinely sought by Iraq includes advanced missile guidance components, such as accelerometers and gyroscopes, specialty metals, special machine tools, and a high-tech, French-made, million-dollar furnace designed to fabricate engine parts for missiles.
- Recent major violations and smuggling efforts:
  - In November, 1995, Iraq was found to have concealed an SS-21 missile it had smuggled in from Yemen.
  - Jordan found that Iraq was smuggling missile components through Jordan in early December 1995. These included 115 gyroscopes in 10 crates, and material for making chemical weapons. The shipment was worth an estimated $25 million. Iraq claimed the gyroscopes were for oil

exploration but they are similar to those used in the Soviet SS-N-18 SLBM. UNSCOM also found some gyroscopes dumped in the Tigris.

- Iraq retains the technology it acquired before the war and evidence clearly indicates an ongoing research and development effort, in spite of the U.N. sanctions regime.
- The fact the agreement allows Iraq to continue producing and testing short-range missiles (less than 150 kilometers range) means it can retain significant missile development effort.
    - The SA-2 is a possible test bed, but UNSCOM has tagged all missiles and monitors all high apogee tests.
    - Iraq's Al-Samoud and Ababil-100 programs are similar test beds. The Al-Samoud is a scaled-down Scud which Iraq seems to have tested.
    - Iraq continues to expand its missile production facility at Ibn Al Haytham, which has two new buildings large enough to make much longer-range missiles.
    - U.S. satellite photographs reveal that Iraq has rebuilt its Al-Kindi missile research facility.
- Ekeus reported on December 18, 1996 that Iraq retained missiles, rocket launchers, fuel, and command system to "make a missile force of significance." UNSCOM reporting as of October 1997 is more optimistic, but notes that Iraq, "continued to conceal documents describing its missile propellants, and the material evidence relating to its claims to have destroyed its indigenous missile production capabilities indicated it might have destroyed less than a tenth of what it claimed."

Chemical Weapons

- Iraq is the only major recent user of weapons of mass destruction. U.S. intelligence sources report the Iraqi uses of chemical weapons shown at the top of the next page.
- In revelations to the U.N., Iraq admitted that, prior to the Gulf War, it:
    - Procured more than 1,000 key pieces of specialized production and support equipment for its chemical warfare program.
    - Maintained large stockpiles of mustard gas, and the nerve agents Sarin and Tabun.

Date	Area	Type of Gas	Approximate Casualties	Target
August 1983	Haij Umran	Mustard	Less than 100	Iranians/Kurds
October-November 1983	Panjwin	Mustard	3,000	Iranians/Kurds
February-March 1984	Majnoon Island	Mustard	2,500	Iranians
March 1984	Al Basrah	Tabun	50-100	Iranians
March 1985	Hawizah Marsh	Mustard/Tabun	3,000	Iranians
February 1986	Al Faw	Mustard/Tabun	8,000-10,000	Iranians
December 1986	Umm ar Rasas	Mustard	1,000s	Iranians
April 1987	Al Basrah	Mustard/Tabun	5,000	Iranians
October 1987	Sumar/Mehran	Mustard/Nerve Agents	3,000	Iranians
March 1988	Halabjah	Mustard/Nerve Agents	100s	Iranians/Kurds

Note: Iranians also used poison gas at Halabjah and may have caused some of the casualties.

- Produced binary Sarin-filled artillery shells, 122 mm rockets, and aerial bombs.
- Manufactured enough precursors to produce 70 tons (70,000 kilograms) of the nerve agent VX. These precursors included 65 tons of choline and 200 tons of phosphorous pentasulfide and di-isopropylamine.
- Tested Ricin, a deadly nerve agent, for use in artillery shells.
- Had three flight tests of long-range Scuds with chemical warheads.
- Had a large VX production effort underway at the time of the Gulf War. The destruction of the related weapons and feedstocks has been claimed by Iraq, but not verified by UNSCOM. Iraq seems to have had at least 3,800 kilograms of V-agents by the time of the Gulf War, and 12-16 missile warheads.

- The majority of Iraq's chemical agents were manufactured at a supposed pesticide plant located at Muthanna. Various other production facilities were also used, including those at Salman Pak, Samara, and Habbiniyah. Though severely damaged

during the war, the physical plant for many of these facilities has been rebuilt.

- Iraq possessed the technology to produce a variety of other persistent and non-persistent agents.
- The Gulf War and the subsequent U.N. inspection regime may have largely eliminated some of stockpiles and reduced production capability.
- During 1991-1994, UNSCOM supervised the destruction of:
  - 38,537 filled and unfilled chemical munitions.
  - 690 tons of chemical warfare agents.
  - More than 3,000 tons of precursor chemicals.
  - Over 100 pieces of remaining production equipment at the Muthan State Establishment, Iraq's primary CW research, production, filling and storage site.
- Since that time, UNSCOM has forced new disclosures from Iraq that have led to:
  - The destruction of 325 newly identified production equipment, 120 of which were only disclosed in August 1997.
  - The destruction of 275 tons of additional precursors.
  - The destruction of 125 analytic instruments.
  - The return of 91 analytic pieces of equipment to Kuwait.
- As of February 1998, UNSCOM had supervised the destruction of a total of:
  - 40,000 munitions, 28,000 filled and 12,000 empty.
  - 480,000 liters of chemical munitions.
  - 1,800,000 liters of chemical precursors.
  - eight types of delivery systems including missile warheads.
- U.S. and U.N. experts believe Iraq has concealed significant stocks of precursors. Iraq also appears to retain significant amounts of production equipment dispersed before, or during, Desert Storm and not recovered by the U.N.
- UNSCOM reports that Iraq has failed to account for:

- Special missile warheads intended for filling with chemical or biological warfare agent.
- The material balance of some 550 155 mm mustard gas shells, the extent of VX programs, and the rationale for the acquisition of various types of chemical weapons.
- 130 tons of chemical warfare agents.
- Some 4,000 tons of declared precursors for chemical weapons.
- The production of several hundred tons of additional chemical warfare agents, and the consumption of chemical precursors.
- 107,500 empty casings for chemical weapons.
- Whether several thousand additional chemical weapons were filled with agents.
- The unilateral destruction of 15,620 weapons, and the fate of 16,038 additional weapons Iraq claimed it had discarded. "The margin of error" in the accounting presented by Iraq is in the "neighborhood of 200 munitions."
- Iraq systematically lied about the existence of its production facilities for VX gas until 1995, and made "significant efforts" to conceal its production capabilities after that date. Uncertainties affecting the destruction of its VX gas still affect some 750 tons of imported precursor chemicals, and 55 tons of domestically produced precursors. Iraq has made unverifiable claims that 460 tons were destroyed by Coalition air attacks, and that it unilaterally destroyed 212 tons. UNSCOM has only been able to verify the destruction of 155 tons and destroy a further 36 tons on its own.

- Iraq has developed basic chemical warhead designs for Scud missiles, rockets, bombs, and shells. Iraq also has spray dispersal systems.
- Iraq maintains extensive stocks of defensive equipment.
- The U.N. feels that Iraq is not currently producing chemical agents, but Iraq has offered no evidence that it has destroyed its VX production capability and/or stockpile. Further, Iraq retains the technology it acquired before the war and evidence clearly indicates an ongoing research and development effort, in spite of the U.N. sanctions regime.

- Recent UNSCOM work confirms that Iraq did deploy gas-filled 155 mm artillery and 122 mm multiple rocket rounds into the rear areas of the KTO during the Gulf War.
- Iraq's chemical weapons had no special visible markings, and were often stored in the same area as conventional weapons.
- Iraq has the technology to produce stable, highly lethal VX gas with long storage times.
- May have developed improved binary and more stable weapons since the Gulf War.
- Since 1992, Iraq attempted to covertly import precursors and production equipment for chemical weapons through Qatar, Saudi Arabia, and Jordan since the Gulf War.
- The current status of the Iraqi program is as follows (according to U.S. intelligence as of February 19, 1998):

Agent	Declared	Potential Unaccounted For	Comments
Chemical Agents	**(Metric Tons)**	**(Metric Tons)**	
VX Nerve Gas	3	300	Iraq lied about the progam until 1995
G Agents (Sarin)	100-150	200	Figures include weaponized and bulk agents
Mustard Gas	500-600	200	Figures include weaponized and bulk agents
Delivery Systems	**(Number)**	**(Number)**	
Missile Warheads	75-100	45-70	UNSCOM supervised destruction of 30
Rockets	100,000	15,000-25,000	UNSCOM supervised destruction of 40,000, 28,000 of which were filled.
Aerial Bombs	16,000	2,000	
Artillery Shells	30,000	15,000	
Aerial Spray Tanks	?	?	

Biological Weapons

- Had highly compartmented "black" program with far tighter security regulations than chemical program.
- Had 18 major sites for some aspect of biological weapons effort before the Gulf War. Most were nondescript and had no guards or visible indications they were a military facility.
- The U.S. targeted only one site during the Gulf War. It struck two sites, one for other reasons. It also struck at least two targets with no biological facilities that it misidentified.
- Systematically lied about biological weapons effort until 1995. First stated that had small defensive efforts, but no offensive effort. In July 1995, admitted had a major defensive effort. In October 1995, finally admitted major weaponization effort.
- Iraq has continued to lie about its biological weapons effort since October 1995. It has claimed the effort was headed by Dr. Taha, a woman who only headed a subordinate effort. It has not admitted to any help by foreign personnel or contractors. It has claimed to have destroyed its weapons, but the one site UNSCOM inspectors visited showed no signs of such destruction and was later said to be the wrong site. It has claimed only 50 people were employed full time, but the scale of the effort would have required several hundred.
- Since July 1995, Iraq has presented three versions of FFCDs and four "drafts."
    - The most recent FFCD was presented by Iraq on 11 September 1997. This submission followed the UNSCOM's rejection of the FFCD of June 1996. In the period since receiving that report, UNSCOM conducted eight inspections in an attempt to investigate critical areas of Iraq's proscribed activities such as warfare agent production and destruction, biological munitions manufacturing, filling and destruction, and military involvement in and support to the proscribed program. Those investigations, confirmed the assessment that the June 1996 declaration was deeply deficient. The UNSCOM concluded that the new FFCD it received on 11 September 1997 contains no significant changes from the June 1996 FFCD.
- Iraq has not admitted to the production of 8,500 liters of anthrax, 19,000 liters of Botulinum toxin, 2,200 liters of Aflatoxin.

- Reports indicate that Iraq tested at least 7 principal biological agents for use against humans.
    - Anthrax, Botulinum, and Aflatoxin are known to be weaponized.
    - Looked at viruses, bacteria, and fungi. Examined the possibility of weaponizing gas gangrene and Mycotoxins. Some field trials were held of these agents.
    - Examined foot and mouth disease, haemorrhagic conjunctivitis virus, rotavirus, and camel pox virus.
    - Conducted research on a "wheat pathogen" and a Mycotoxin similar to "yellow rain" defoliant.
    - The "wheat smut" was first produced at Al Salman, and then put in major production during 1987-1988 at a plant near Mosul. Iraq claims the program was abandoned.
    - The August 1995 defection of Lieutenant General Husayn Kamel Majid, formerly in charge of Iraq's weapons of mass destruction, revealed the extent of this biological weapons program. Lt. General Kamel's defection prompted Iraq to admit that it:
        - Imported 39 tons of growth media (31,000 kilograms or 68,200 pounds) for biological agents obtained from three European firms. According to UNSCOM, 3,500 kilograms (or 7,700 pounds) remains unaccounted for. Some estimates go as high as 17 tons. Each ton can be used to produce 10 tons of bacteriological weapons.
        - Imported type cultures from the U.S. which can be modified to develop biological weapons.
        - Had a laboratory- and industrial-scale capability to manufacture various biological agents including the bacteria which cause Anthrax and botulism; Aflatoxin, a naturally occurring carcinogen; clostridium perfringens, a gangrene-causing agent; the protein toxin Ricin; tricothecene Mycotoxins, such as T-2 and DAS; and an anti-wheat fungus known as wheat cover smut. Iraq also conducted research into the rotavirus, the camel pox virus and the virus which causes haemorrhagic conjunctivitis.
        - Created at least seven primary production facilities including the Sepp Institute at Muthanna, the Ghazi

Research Institute at Amaria, the Daura Foot and Mouth Disease Institute, and facilities at Al-Hakim, Salman Pak Taji, and Fudaliyah. According to UNSCOM, weaponization occurred primarily at Muthanna through May 1987 (largely Botulinum), and then moved to Al Salman (Anthrax). In March 1988 a plant was open at Al Hakim, and in 1989 an Aflatoxin plant was set up at Fudaliyah.

- Had test site about 200 kilometers west of Baghdad, used animals in cages and tested artillery and rocket rounds against live targets at ranges up to 16 kilometers.

- Took fermenters and other equipment from Kuwait to improve effort during the Gulf War.

- Iraq had at least 79 civilian facilities capable of playing some role in biological weapons production still in existence in 1997.

- The Iraqi program involving Aflatoxin leaves many questions unanswered.

  - Iraqi research on Aflatoxin began in May 1988 at Al Salman, where the toxin was produced by the growth of fungus aspergilus in 5.3 quart flasks.

  - The motives behind Iraq's research on Aflatoxin remain one of the most speculative aspects of its program. Aflatoxin is associated with fungal-contaminated food grains, and is considered non-lethal. It normally can produce liver cancer, but only after a period of months to years and in intense concentrations. There is speculation, however, that a weaponized form might cause death within days and some speculation that it can be used as an incapacitating agent.

  - Iraq moved its production of Aflatoxin to Fudaliyah in 1989, and produced 481 gallons of toxin in solution between November 1988 and May 1990.

  - It developed 16 R-400 Aflatoxin bombs and two Scud warheads. Conducted trials with Aflatoxin in 122 mm rockets and R-400 bombs in November 1989 and May and August 1990. Produced a total of 572 gallons of toxin and loaded 410.8 gallons into munitions.

- UNSCOM concluded in October, 1997, that Iraq's accounting for its Aflatoxin production was not credible.

- Total Iraqi production of more orthodox biological weapons reached at least 19,000 liters of concentrated Botulinum (10,000 liters filled into munitions); 8,500 liters of concentrated Anthrax (6,500 liters filled into munitions); and 2,500 liters of concentrated Aflatoxin (1,850 liters filled into munitions).
  - It manufactured 6,000 liters of concentrated Botulinum toxin and 8,425 liters of Anthrax at Al-Hakim during 1990; 5400 liters of concentrated Botulinum toxin at the Daura Foot and Mouth Disease Institute from November 1990 to January 15, 1991; 400 liters of concentrated Botulinum toxin at Taji; and 150 liters of concentrated Anthrax at Salman Pak.
  - Iraq is also known to have produced at least:
    - 1,850 liters of Aflatoxin in solution at Fudaliyah.
    - 340 liters of concentrated clostridium perfringens, a gangrene-causing biological agent, beginning in August 1990.
    - 10 liters of concentrated Ricin at Al Salam. Claim abandoned work after tests failed.
- Iraq weaponized at least three biological agents for use in the Gulf War. The weaponization consisted of at least:
  - 100 bombs and 16 missile warheads loaded with Botulinum.
  - 50 R-400 air-delivered bombs and 5 missile warheads loaded with anthrax; and
  - 4 missile warheads and 7 R-400 bombs loaded with Aflatoxin, a natural carcinogen.
  - The warheads were designed for operability with the Al Husayn Scud variant.
- Iraq had other weaponization activities:
  - Armed 155 mm artillery shells and 122 mm rockets with biological agents.
  - Conducted field trials, weaponization tests, and live firings of 122 mm rockets armed with Anthrax and Botulinum toxin from March 1988 to May 1990.

- Tested Ricin, a deadly protein toxin, for use in artillery shells.
- Iraq produced at least 191 bombs and 25 missile warheads with biological agents.
- Developed and deployed 250 pound aluminum bombs covered in fiberglass. Bombs were designed so they could be mounted on both Soviet and French-made aircraft. They were rigged with parachutes for low altitude drops to allow efficient slow delivery and aircraft to fly under radar coverage. Some debate over whether bombs had cluster munitions or simply dispersed agent like LD-400 chemical bomb.
- Deployed at least 166 R-400 bombs with 85 liters of biological agents each during the Gulf War. Deployed them at two sites. One was near an abandoned runway where it could fly in aircraft, arm them quickly, and disperse with no prior indication of activity and no reason for the U.N. to target the runway.
- Filled at least 25 Scud missile warheads, and 157 bombs and aerial dispensers, with biological agents during the Gulf War.

- Developed and stored drop tanks ready for use for three aircraft or RPV s with the capability of dispersing 2,000 liters of anthrax. Development took place in December 1990. Claimed later that tests showed the systems were ineffective.
  - The U.N. found, however, that Iraq equipped crop spraying helicopters for biological warfare and held exercises and tests simulating the spraying of Anthrax spores.
  - Iraqi Mirages were given spray tanks to disperse biological agents.
    - Held trials as late as January 13, 1991.
    - The Mirages were chosen because they have large 2,200 liter belly tanks and could be refueled by air, giving them a longer endurance and greater strike range.
    - The tanks had electric valves to allow the agent to be released and the system was tested by releasing simulated agent into desert areas with scattered petri dishes to detect the biological agent. UNSCOM has video tapes of the aircraft.

- Project 144 at Taji produced at least 25 operational Al Husayn warheads. Ten of these were hidden deep in a railway tunnel, and 15 in holes dug in an unmanned hide site along the Tigris.
- Biological weapons were only distinguished from regular weapons by a black stripe.
- The U.N. claims that Iraq has offered no evidence to corroborate its claims that it destroyed its stockpile of biological agents after the Gulf War. Further, Iraq retains the technology it acquired before the war and evidence clearly indicates an ongoing research and development effort, in spite of the U.N. sanctions regime.
- UNSCOM reported in October 1997 that:
    - Iraq has never provided a clear picture of the role of its military in its biological warfare program, and has claimed it only played a token role.
    - It has never accounted for its disposal of growth media. The unaccounted for media is sufficient, in quantity, for the production of over three times more of the biological agent—Anthrax—Iraq claims to have been produced.
    - Bulk warfare agent production appears to be vastly understated by Iraq. Expert calculations of possible agent production quantities, either by equipment capacity or growth media amounts, far exceed Iraq's stated results.
    - Significant periods when Iraq claims its fermenters were not utilized are unexplained.
    - Biological warfare field trials are underreported and inadequately described.
    - Claims regarding field trials of chemical and biological weapons using R400 bombs are contradictory and indicate that "more munitions were destroyed than were produced."
    - The Commission is unable to verify that the "unilateral destruction of the BW-filled Al Hussein warheads has taken place."
    - There is no way to confirm whether Iraq destroyed 157 bombs of the R400 type, some of which were filled with Botulin or anthrax spores.
    - "The September 1997 FFCD fails to give a remotely credible account of Iraq's biological program. This opinion has been endorsed by an international panel of experts."

- The current status of the Iraqi program is as follows (according to U.S. intelligence as of February 19, 1998):
- UNSCOM cannot confirm the unilateral destruction of 25 warheads. It can confirm the destruction of 23 of at least 157 bombs. Iraq may have more aerosol tanks.

	Declared Concentrated Amount		Declared Total Amount		Uncertainty
Agent	Liters	Gallons	Liters	Gallons	
Anthrax	8,500	12,245	85,000	22,457	Could be 3-4 times declared amount
Botulinum toxin	19,400	NA	380,000	NA	Probably twice declared amount. Some extremely concentrated.
Gas Gangrene Clostridium Perfingens	340	90	3,400	900	Amounts could be higher
Aflatoxin	NA	NA	2,200	581	Major uncertainties
Ricin	NA	NA	10	2.7	Major uncertainties

- U.N. currently inspects 79 sites—5 used to make weapons before war; 5 vaccine or pharmaceutical sites; 35 research and university sites; 13 breweries, distilleries, and dairies with dual-purpose capabilities; 8 diagnostic laboratories.
- Iraq retains laboratory capability to manufacture various biological agents including the bacteria which cause anthrax, botulism, tularemia and typhoid.
- Many additional civilian facilities are capable of playing some role in biological weapons production.

Nuclear Weapons

- Inspections by U.N. teams have found evidence of two successful weapons designs, a neutron initiator, explosives and triggering technology needed for production of bombs, plutonium processing technology, centrifuge technology, Calutron enrichment technology, and experiments with chemical separation technology. Iraq had some expert technical support, including at least one German scientist who provided the technical plans for the URENCO TC-11 centrifuge.
- Iraq's main nuclear weapons related facilities were:

- Al Atheer—center of nuclear weapons program. Uranium metallurgy; production of shaped charges for bombs, remote controlled facilities for high explosives manufacture.
- Al Tuwaitha—triggering systems, neutron initiators, uranium metallurgy, and hot cells for plutonium separation. Laboratory production of UO_2, UCL_4, UF_6, and fuel fabrication facility. Prototype-scale gas centrifuge, prototype EMIS facility, and testing of laser isotope separation technology.
- Al Qa Qa—high explosives storage, testing of detonators for high explosive component of implosion nuclear weapons.
- Al Musaiyib/Al Hatteen—high explosive testing, hydrodynamic studies of bombs.
- Al Hadre—firing range for high explosive devices, including FAE.
- Ash Sharqat—designed for mass production of weapons grade material using EMIS.
- Al Furat—designed for mass production of weapons grade material using centrifuge method.
- Al Jesira (Mosul)—mass production of UCL_4.
- Al Qaim—phosphate plant for production of U308.
- Akashat uranium mine.

- Iraq had three reactor programs:
  - Osiraq/Tammuz I: 40 megawatt light-water reactor destroyed by Israeli air attack in 1981.
  - Isis/Tammuz II: 800 kilowatt light water reactor destroyed by Coalition air attack in 1991.
  - IRT-5000: 5 megawatt light water reactor damaged by Coalition air attack in 1991.
- Iraq used Calutron (EMIS), centrifuges, plutonium processing, chemical defusion and foreign purchases to create new production capability after Israel destroyed most of Osiraq.
- Iraq established a centrifuge enrichment system in Rashidya and conducted research into the nuclear fuel cycle to facilitate development of a nuclear device.

- After invading Kuwait, Iraq attempted to accelerate its program to develop a nuclear weapon by using radioactive fuel from French and Russian-built reactors. It made a crash effort in September 1990 to recover enriched fuel from its supposedly safe-guarded French and Russian reactors, with the goal of producing a nuclear weapon by April 1991. The program was only halted after Coalition air raids destroyed key facilities on January 17, 1991.
- Iraq conducted research into the production of a radiological weapon, which disperses lethal radioactive material without initiating a nuclear explosion.
    - Orders were given in 1987 to explore the use of radiological weapons for area denial in the Iran-Iraq War.
    - Three prototype bombs were detonated at test sites—one as a ground level static test and two others were dropped from aircraft.
    - Iraq claims the results were disappointing and the project was shelved but has no records or evidence to prove this.
- U.N. teams have found and destroyed, or secured, new stockpiles of illegal enriched material, major production and R&D facilities, and equipment—including Calutron enriching equipment.
- UNSCOM believes that Iraq's nuclear program has been largely disabled and remains incapacitated, but warns that Iraq retains substantial technology and established a clandestine purchasing system in 1990 that it has used to import forbidden components since the Gulf War.
- The major remaining uncertainties are:
    - Iraq still retains the technology developed before the Gulf War and U.S. experts believe an ongoing research and development effort continues, in spite of the U.N. sanctions regime.
    - Did Iraq conceal an effective high speed centrifuge program?
    - Are there elements for radiological weapons?
    - Is it actively seeking to clandestinely buy components for nuclear weapons and examining the purchase of fissile material from outside Iraq?

- Is it continuing with the development of a missile warhead suited to the use of a nuclear device?
- A substantial number of declared nuclear weapons components and research equipment has never been recovered. There is no reason to assume that Iraqi declarations were comprehensive.

The Sudan's Search for Weapons of Mass Destruction.

Delivery Systems

- No evidence of a program.
- The Sudan does have F-5, MiG-21, and MiG-23 attack fighters.

Chemical Weapons

- Khartoum served as the site of a VX nerve gas production facility at the Shifa Pharmaceutical Plant, which was linked to the terrorist Osama Bin Laden. It was destroyed by U.S. cruise missiles on August 20, 1998.

Biological Weapons

- May be some early research activity related to terrorist groups.
- No evidence of production capability.

Nuclear Weapons

- No evidence of any program.

Source: Prepared by Anthony H. Cordesman, Co-Director, Middle East Program, CSIS.

APPENDIX C

IRAQI BREAK OUT CAPABILITIES

- UNSCOM and the IAEA's success have created new priorities for Iraqi proliferation. The U.N.'s success in destroying the large facilities Iraq needs to produce fissile materials already may well have led Iraq to focus on covert cell-like activities to manufacture highly lethal biological weapons as a substitute for nuclear weapons.
- All of the biological agents Iraq had at the time of the Gulf War seem to have been "wet" agents with limited storage life and limited operational lethality. Iraq may have clandestinely carried out all of the research necessarily to develop a production capability for dry-storage micro-power weapons which would be far easier to clandestinely stockpile, and have much more operational lethality.
- Iraq did not have advanced binary chemical weapons and most of its chemical weapons used unstable ingredients. Iraq has illegally imported specialized glassware since the Gulf War, and may well have developed advanced binary weapons and tested them in small numbers. It may be able to use a wider range of precursors and have developed plans to produce precursors in Iraq. It may have improved its technology for the production of VX gas.
- Iraq is likely to covertly exploit Western analyses and critiques of its pre-war proliferation efforts to correct many of the problems in the organization of its proliferation efforts, its weapons design, and its organization for their use.
- Iraq bombs and warheads were relatively crude designs which did not store chemical and biological agents well and which did a poor job of dispersing them. Fusing and detonation systems did a poor job of ensuring detonation at the right height and Iraq made little use of remote sensors and weather models for long-range targeting and strike planning. Iraq could clandestinely design and test greatly improved shells, bombs, and warheads. The key tests could be conducted using towers, simulated agents, and even indoors. Improved targeting, weather sensors, and other aids to strike planning are dual-use or civil technologies that are not controlled by UNSCOM. The net impact would be weapons

that could be 5-10 times more effective than the relatively crude designs Iraq had rushed into service under the pressure of the Iran-Iraq War.

- UNSCOM and the IAEA's success give Iraq an equally high priority to explore ways of obtaining fissile material from the FSU or any other potential supplier country and prepare for a major purchase effort the moment sanctions and inspections are lifted and Iraq has the hard currency to buy its way into the nuclear club. Iraq could probably clandestinely assemble all of the components of a large nuclear device except the fissile material, hoping to find some illegal source of such material.

- The components for cruise missiles are becoming steadily more available on the commercial market, and Iraq has every incentive to create a covert program to examine the possibility of manufacturing or assembling cruise missiles in Iraq.

- U.N. inspections and sanctions may also drive Iraq to adopt new delivery methods ranging from clandestine delivery and the use of proxies to sheltered launch-on-warning capabilities designed to counter the U.S. advantage in airpower.

- Iraq can legally maintain and test missiles with ranges up to 150 kilometers. This allows for exoatmospheric reentry testing and some testing of improved guidance systems. Computer simulation, wind tunnel models, and production engineering tests can all be carried out clandestinely under the present inspection regime. It is possible that Iraq could develop dummy or operational high explosive warheads with shapes and weight distribution of a kind that would allow it to test concepts for improving its warheads for weapons of mass destruction. The testing of improved bombs using simulated agents would be almost impossible to detect as would the testing of improved spray systems for biological warfare.

- Iraq has had half a decade in which to improve its decoys, dispersal concepts, dedicated command and control links, targeting methods, and strike plans. This kind of passive warfare planning is impossible to forbid and monitor, but ultimately is as important and lethal as any improvement in hardware.

- There is no evidence that Iraq made an effort to develop specialized chemical and biological devices for covert operations, proxy warfare, or terrorist use. It would be simple to do so clandestinely and they would be simple to manufacture.

CHAPTER 7

TERRORISM AND WEAPONS OF MASS DESTRUCTION

The most serious challenge the West may face from the Middle East may be the risk of proliferation interacting with terrorism. At present, this is only a possibility. No Middle East state or faction has yet made any attempt to use weapons of mass destruction in transregional attacks on the West, although the United States launched cruise missiles strikes against the Shifa Pharmaceutical Plant in Khartoum on August 20, 1998, in a preemptive attempt to prevent the production and use of VX nerve gas by a leading terrorist—Osama Bin Laden.

The basic problem for the West, and indeed for the Middle Eastern states which are as likely to be terrorist targets as the West, is that terrorist attacks using weapons of mass destruction present a fundamentally different kind of threat. They are a far more lethal kind of terrorist threat than the West has yet faced, and they offer radical Middle Eastern states and terrorist factions a relatively easy way to bypass many of the defenses proposed as part of counterproliferation.

Under many conditions, a single act of such terrorism can kill thousands of people and/or induce levels of panic and political reaction that governments cannot easily deal with. Under some conditions, the use of weapons of mass destruction can pose an existential threat to the existing social and political structure of a small country—particularly one where much of the population and governing elite is concentrated in a single urban area. The comparative seriousness of these risks is illustrated in Table 7, which summarizes the potential casualties resulting from the use of a weapon of mass destruction in an

urban area similar to the capital or major urban center of most Middle Eastern countries.

The data in Table 7 must be kept in careful perspective. They are drawn from sources designed to estimate the impact of efficient and well-designed military weapons, and it is unclear how the effects of a terrorist attack using improvised, nonmilitary weapons would compare with those of such a military attack. On the one hand, a terrorist weapon might be substantially less lethal. On the other hand, a terrorist potentially could use a much larger device than could be carried by a missile, and could chose the best sunlight and weather conditions for an attack. They might well be able to deliver biological agents covertly under optimal “line source” or aerosol conditions.

Further complications exist because the lethality data on the effects of biological and chemical weapons are notoriously uncertain, and many such data are overstated by the tendency of “technical experts” to exaggerate the threat from the weapon that is in their area of expertise. At the same time, losses could be worse if an attack involved a highly persistent chemical agent like VX, or a more lethal biological agent than anthrax. Further, the nuclear data include only prompt casualties (within 48-96 hours), and ignore the increase in the longer-term death rate from radiation and fallout because no reliable system exists for estimating such losses.[1]

Critical assumptions about medical and emergency response capabilities and about warning and civil defense are made in Table 7. The table may exaggerate estimated casualties because it assumes that no warning and major civil defense activities take place. These assumptions may reduce estimated casualties, because they assume that wounded and infected personal receive adequate medical treatment from the facilities of an advanced industrialized nation and large reserves of medical and emergency response personnel from outside the area under direct attack. This assumption is likely to sharply exaggerate the

Using missile warheads: Assumes one Scud-sized warhead with a maximum payload of 1,000 kilograms. The study assumes that the biological agent would not make maximum use of this payload capability because this is inefficient. It is unclear that this is realistic.

	Area Covered in Square Kilometers	Deaths Assuming 3,000-10,000 people Per Square Kilometer
Chemical: 300 kilograms of Sarin nerve gas with a density of 70 milligrams per cubic meter	0.22	60-200
Biological: 30 kilograms of Anthrax spores with a density of 0.1 milligram per cubic meter	10	30,000-100,000
Nuclear: One 12.5 kiloton nuclear device achieving 5 pounds per cubic inch of over-pressure	7.8	23,000-80,000
One 1 megaton hydrogen bomb	190	570,000-1,900,000

Using one aircraft delivering 1,000 kilograms of Sarin nerve gas or 100 kilograms of anthrax spores: Assumes the aircraft flies in a straight line over the target at optimal altitude and dispensing the agent as an aerosol. The study assumes that the biological agent would not make maximum use of this payload capability because this is inefficient. It is unclear that this is realistic.

	Area Covered in Square Kilometers	Deaths Assuming 3,000-10,000 people Per Square Kilometer
Clear sunny day, light breeze		
Sarin Nerve Gas	0.74	300-700
Anthrax Spores	46	130,000-460,000
Overcast day or night, moderate wind		
Sarin Nerve Gas	0.8	400-800
Anthrax Spores	140	420,000-1,400,000
Clear calm night		
Sarin Nerve Gas	7.8	3,000-8,000
Anthrax Spores	300	1,000,000-3,000,000

Source: Adapted by the Anthony H. Cordesman from Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, Washington: U.S. Congress OTA-ISC-559, August 1993, pp. 53-54.

Table 7. Comparative Effects of Biological, Chemical, and Nuclear Weapons Delivered Against a Typical Urban Target.

available medical resources in most Middle Eastern countries.

The assumption of adequate medical and emergency response personnel often heavily depends on medical and emergency personnel fleeing the area under attack or immediately recognizing the true character of the attack and taking suitable precautions. Properly characterizing the attack may be impossible even for the most advanced countries, particularly if a new biological agent is used, if an agent is used whose effects take several days to become apparent, or if "cocktails" are used of different agents where the agent whose effects initially become apparent may lead to an emergency/medical response that exposes and kills limited cadres of trained personnel. Further, untrained or highly motivated medical and emergency personnel tend to rush in to provide treatment, become exposed, and die.

What is clear is that Table 7 shows that a well-planned act of terrorism involving the use of weapons of mass destruction could involve a "paradigm shift" in the nature of terrorism and counterterrorism. Unlike other forms of terrorism, Middle Eastern governments and societies might not be able to ride out a new form of attack. A successful act of mass terrorism could destroy a political elite, key elements of an economy, a key elite or element of a Middle Eastern society, or popular willingness to remain in a threatened state. It could have a massive impact on immigration/emigration in a nation like Israel, or the foreign labor forces in a Gulf state. It could have a major strategic impact on U.S. public support for the deployment of U.S. power projection forces.

The Uncertainties Inherent in Terrorism Using Weapons of Mass Destruction.

Terrorist attacks using weapons of mass destruction would also involve far more than physical or human destruction. They would have political and strategic motives that could radically alter the strategic situation. In

a region like the Middle East, they could provoke a level of political reaction and/or escalation that could lead to massive retaliatory escalation or destroy the prospects of conflict resolution for years. At a minimum, neither Middle Eastern governments nor their peoples would have any experience in dealing with such an attack, and they would not have the time to adapt and learn provided by wartime preparations or a series of more conventional terrorist attacks.

These risks are illustrated in Appendix D, and it is important to put them in perspective. Novels, movies, and war games can assume that such attacks would lead to a proportionate and carefully judged response by calculating rational bargainers—particularly since most such scenarios and games deal with the risk by preventing an attack, minimizing the effect of an attack, or immediately containing the situation. Novels and screen plays can imagine a far-sighted or lucky hero for every "Abu Moriarity" or "Dr. Ben No."

However, human history does not inspire similar confidence. Terrorists are not always "rational" or capable of dealing with their enemies in terms of shared values or restraint. Governments do not organize to deal with unanticipated threats or organize well for new threats. Heroes and heroines are rare, and the reactions of an attacked Middle Eastern state or people could be extremely dangerous and unpredictable. At some point, the survivors might well lash out in a mix of panic, hatred, fear, and revenge, and this seems to be particularly true if an attack is perceived as posing an existential threat.

Consider, for a moment, the real world problems that would be posed by a large-scale and successful terrorist use of weapons of mass destruction:

- Unlike military attacks in war, the source of the attack might well be unknown. In the case of a biological, chemical, or radiological attack, the victim

might not detect the attack for a period of days or weeks. This was certainly the case during the Gulf War. The United States initially estimated that none of its troops were exposed to chemical weapons, only to reach an estimate that more than 15,000 might have been exposed some 5 years later.

- While no one can dismiss the possibility that the attacker(s) would be too much of an egotist to remain silent, the attacker(s) would have every possible incentive to conduct such an attack covertly and to lay the ground work for a covert follow-on attack capability. There would also be a strong motive to lay a false trail and blame another movement or government for the attack, or to launch such an attack at a moment of high tension between two governments that the attacker(s) opposed.

- It would often be impossible to distinguish the level of support for such an attack by an enemy state. The use of terrorist proxies might be impossible to distinguish from loose ties between a hostile government and an extremist movement. Some governments might also support a range of terrorist groups, knowing that the net result could be a serious attack with plausible deniability. The problem of identifying the real enemy could be critical.

- The government of an attacked state may well not be prepared to deal with the problem of escalation, and might lack any structure and plans for dealing simultaneously with the impact of terrorism and a crisis in interstate relations. The use of such weapons might be intended to destroy or prevent a peace process, rather than exacerbate a conflict. At the same time, such an attack might be so crippling that the victim might feel it could not accept the resulting losses without attacking an enemy state.

- There would be no easy way for any one to characterize losses and damage. It is virtually certain that the attacker would lack any empirical basis for estimating the end effect of a given attack, as would any hostile government using a terrorist proxy. The victim might find it extremely difficult to estimate even prompt losses and damage effects, and would face critical problems in estimating the impact of biological weapons or long-term radiation. "Cocktails" of different weapons could be used with different effects and target mixes. Friendly and hostile governments would have to rely on guesswork or on the victim government. Media reporting would be virtually certain to vastly exaggerate the effect of such weapons and present a constant series of video horror shows, and public opinion would probably pay only limited attention to expert analysis.

- Defense can be extremely difficult because it will usually be impossible to predict the method of attack. For example, the United States has decided to immunize its troops against Anthrax because of evidence that this agent has been weaponized in the Middle East. A terrorist attack can chose from a wide range of different agents. Similarly, a terrorist attack may occur from within a defensive perimeter, bypass any air and missile defenses, and/or be tailored to defeat national holdings of NBC detection, protection, and decontamination gear.

- Medical services would be at high risk as the victims of direct attack or because of efforts to treat initial casualties that led to the death of medical and emergency personnel, and outside emergency response capability is likely to be extremely limited. Few governments are likely to train medical teams to flee the area under attack, and such training or guidance is unlikely to have much practical impact until medical and emergency response teams learn

the hard way. Some biological weapons have no treatment—a problem that could be greatly complicated by a "cocktail" of different weapons and the risk that a terrorist would use infectious agents. No medical or emergency response team would have any practical experience with the particular weapon involved—if it could even be promptly identified. There would be little or no basis for triage or assessing the scale of the attack and future risks.

- Police, intelligence, internal security, and military forces could take serious casualties—including their top leadership. At the same time, most such forces would have little or no training to deal with such attacks and the threat of further prompt attacks. They would have no practical experience, and often would lack enough understanding of the attack and threat to properly respond.

- All of the actors involved in preemption, retaliation, and every aspect of the escalation ladder in the transition from terrorism to an interstate conflict would be operating under intense pressure and with minimal understanding of the crisis. There might be a strong rational case for the Middle Eastern state that became the subject of such an attack to wait until it could fully characterize the attack and know the cause, but such an argument might prove irrelevant in a crisis. Further, states might refuse to delay and let an opponent gain a decisive edge, or feel that they had to launch an immediate attack to prevent follow-on attacks and/or restraint by outside countries. Terrorism might catalyze a series of attacks by hostile states like Israel and Syria—or Iran and Iraq—in which the process of escalation rapidly degenerated into near chaos.

- Outside aid, however well-intentioned, could take considerable time to mobilize and might have to enter

a nation or major urban area in a state of crisis or collapse. Efforts to negotiate some form of restraint or conflict limitation would also be confused and might lag badly behind the action-reaction cycle of states with weapons of mass destruction.

Unlike relations and conflicts between governments, where communication and experience tend to limit conflicts and establish a structured basis of deterrence, terrorism involving weapons of mass destruction has no rules. Such terrorism could instantly achieve higher levels of damage than most regional conventional wars. It could attack virtually any target set. It would have no clear level of restraint, there might be little or no fear of retaliation, and governments would have no way to evaluate the risk and nature of follow-on attacks. The complex mix of political, social, and military relations shaping and stabilizing most state-to-state conflicts would be missing.

Scenarios for Terrorism Using Weapons of Mass Destruction.

It should be stressed that the risks of terrorism using weapons of mass destruction are now largely theoretical. There are only token indicators of Middle Eastern terrorist activity involving weapons of mass destruction. A few crude devices have been detected using explosives and chemical agents (grenades with a small canister of mustard gas). The principal case of actual acts of terrorism consists of a limited effort to poison Israeli agricultural exports, direct attempts at poisoning such as lacing champagne with cyanide at a Russian military New Year's Day celebration in Tajikistan in January 1995, and PKK attempts to poison Turkish water supplies with cyanide.[2] Such efforts make a sharp contrast to the massive national efforts Iran, Iraq, Libya, and Syria are making to acquire weapons of a mass destruction.

The Iranian Republic Guards, which are a key source of Iranian support to extremists, do operate many of Iran's

chemical and biological weapons and missiles. Highly political elements of Iraq's armed forces, intelligence branches, and military procurement offices have purchased dual-use items or managed missile and WMD programs. There have been some scattered efforts by extremist movements to examine biological technology, and some crude efforts to modify insecticides, and poison fruit and vegetable exports. However, there have been no "Dr. Ben Nos" and "Professor Abu Moriarities," and there only have been hints that states are considering direct or proxy support of terrorism and unconventional warfare using weapons of mass destruction.

At the same time, the question arises as to whether the West can rely on effective strategic warning or a reactive approach to this problem. Most new terrorist groups get at least one "free ride" attack before their existence and/or true character is detected. An effective "super-terrorist" would also have a number of major advantages over any state or conventional enemy. Virtually any means of delivery could be used. The weapon would not have to be stable, reliable, or safe. This would allow the use of chemical weapons that would not be safe to militarize, and even infectious biological agents. Damage effects could be highly unpredictable since the objective would often be terror, and not predictable tactical and/or strategic effects.

Delayed effects and prolonged contamination would often be desirable. Martyrdom and/or lack of attribution would sometimes be acceptable. States supporting proxy efforts could afford to work slowly and indirectly—potentially preserving a high degree of deniability. Massive civilian casualties would often be desirable, and many terrorist movements could act without fear of retaliation or any retribution greater than for a minor act of conventional terrorism that involved much more limited casualties.

Appendix E provides a more tangible illustration of this point. It may seem to borrow from bad spy novels and science fiction, but it lists a group of scenarios that are at

least technically possible. These scenarios also illustrate the fact that terrorists do not need sophisticated military delivery systems, do not need highly lethal weapons, can use terrorism to pose existential threats, can use complex mixes of weapons of mass destruction, and can mix terrorism with elements of covert action and deniability.

Much again depends on the human dimension and the real-world difference between actual terrorist groups and the super-terrorist that would have to execute such scenarios. The danger of such scenarios is that they tend to overstate the willingness of terrorists to turn to extreme forms of terror, their willingness to risk dying, and their ability to undetectably engage in complex scenarios. They also depend heavily on the technical ability of terrorists to obtain and control weapons of mass destruction.

There is nothing admirable about Middle Eastern extremists of any persuasion, but an examination of the groups so far described in U.S. reporting indicates that most are likely to set clear limits to the scale of their actions and how broadly they target them outside the Middle East.[3] Regardless of how one may feel about Islamic extremists, secular terrorists, and radical governments like Iran, Iraq and Libya, most state sponsors of terrorism and most extremist groups do not seem likely to turn to mass murder without some provocation.[4]

While terrorists are often stereotyped as acting without moral limits and as willing martyrs, few have actually conformed with such stereotypes. These few exceptions have included Omar Qadhafi in Libya, Osama Bin Laden, the extremist elements of Hamas, the Islamic Jihad in Egypt, and the GIA in Algeria.

Although some effort was made to use chemical poisonings during the World Trade Center bombing, Bin Laden is the only Middle Eastern terrorist who has so far been identified with serious attempts to produce chemical and nuclear weapons. There are strong indications that he is associated with plants in the Sudan that may be

producing the precursors for VX nerve gas, and the U.S. State Department has charged that Bin Laden attempted to buy enriched Uranium for a nuclear bomb. Bin Laden's association with two plants in the Sudan was a major factor that led the U.S. to launch cruise missiles against the Shifa Pharmaceutical Plant in Khartoum on August 20, 1998. Bin Laden is reported to have authorized his main organization, al Qaida, to try to buy nuclear materials in 1993.[5]

Most "terrorists" are someone else's "freedom fighters" and operate within significant self or group-imposed constraints. Similarly, it is far from clear that most regional states are willing to take the kind of risks inherent in the scenarios postulated in Appendix E.

At the same time, the steady escalation of car and truck bombings is a clear demonstration of the willingness to indulge in indiscriminate killing. The rhetoric and ideology of a number of other terrorist movements like the Palestine Islamic Jihad and Combatant Partisans of God scarcely rules out mass murder. In fact, Sheik Yassin—the founder of Hamas—praised the 1998 attacks on the U.S. Embassies in Kenya and Tanzania. A total breakdown in the Arab-Israeli peace process, and/or a new Intifada, might lead to the creation of far more violent terrorist groups. Iraq and Libya may end in seeking revenge once they break out of sanctions. Moderation in Iran is uncertain, and Iranian extremists may even see some massive act of terrorism as a way of ending President Khatami's efforts to move towards improved Iranian relations with the West.

Most of the scenarios in Appendix E are only marginally more complex than recent bombings, and only a few require large numbers of people and complex technical activity. The actions of Aum Shinrikyo in Japan illustrate the fact that it can be extremely difficult to characterize the level of extremism and capability for sophisticated action within a group until it has committed at least one action of terror. The cell structure used by the violent elements of most Middle Eastern extremist groups also tends to encourage

the creation of compartmented groups with different and unpredictable commitments to violence while the loose and informal chain of contacts between extremist movements, known terrorist groups, and radical governments creates the possibly of random or unpredictable transfers of technology or weapons.

The institutionalization of state violence in the Middle East also creates a cumulative risk that opposition elements will be provoked into such forms of terrorism. The interactions between secular governmental repression and Islamic extremists, and the widespread repression of ethnic and religious groups create a climate which may lead to new forms of terrorism. Endemic conflicts like the Arab-Israeli conflict and Iranian-Iraqi search for hegemony in the Gulf breed growing technical sophistication as well as extremism.

Terrorism and Chemical Weapons.

Much of the terrorist impact of chemical weapons is based on myth. Regardless of the theoretical lethality of given chemical agents, many cannot be weaponized in ways that are vastly more lethal than conventional bombs and explosions.[6] Terrorists are not governments, and may well spend more terrorist money and man-hours per casualty on chemical weapons than if they concentrated on carefully planning conventional attacks. Contrary to a considerable amount of literature, chemical weapons also are not uniquely horrifying in terms of their killing, wounding, or incapacitating effects. Trauma from penetrating and ripping projectiles is likely to be as agonizing as the long-term effects of mustard gas. Nerve gases are relatively humane killers with few lingering effects. Once one strips away the rhetoric, gutted is gutted and dead is dead.

The problem is, however, that the myths surrounding chemical weapons do exist and shape popular perceptions. Regardless of actual casualties, terrorist attacks using chemical weapons are likely to produce far more panic and

fear than attacks using conventional weapons. Further, chemical attacks can easily be combined with large scale bombings and other terrorist "cocktails"—an option that is described in detail in so much of the literature on counterterrorism than only illiterate or truly stupid terrorists can be unaware of it.

The psychological dimension of chemical terrorism can also interact with the physiological dimension. The long U.S. debates over Agent Orange and the Persian Gulf Syndrome have already shown that there also is no clear end game to an act of chemical terrorism. Even the threat of exposure can create political and medical problems for decades, and no government announcement that a given area or facility is safe will ever fully convince public opinion.

The deliberate smuggling of trace amounts of persistent chemical weapons like mustard gas, V-series agents, and toxins into a wide range of target areas would be an ideal strategy for a terrorist concerned with maximizing the effect of terrorism, minimizing the risk of detection, and avoiding the backlash from large numbers of real casualties. Terrorists might also use a number of ordinary consumer goods to produce small amounts of chemical poisons for such localized attacks. One highly publicized option in counterterrorist literature is to burn Teflon in a closed space (the result is phosgene, hydrogen fluoride, and sub-micro polymeric fumes).[7]

Much would depend on the agent used and how well it was produced and deployed. For example, Aum Shinrikyo—the Japanese cult that used Sarin in the Tokyo subway attack—made a long series of mistakes. It produced Sarin using the German salt process, its production plant never functioned properly, and the agent was only 25 percent pure when first manufactured. One of its attacks occurred only days after 500 Japanese police had taken a chemical agent response course and under panicked, unrehearsed conditions. The cult used a crude delivery method. It placed punctured dual polyethylene bags on the

subway rather than using the trucks it had modified to use sprayers. The agent was extremely slow to evaporate, giving many people time to leave the area. Even so, some 5,100 people had to be screened (4,073 the first day), 2,058 had to be observed in clinics, 984 had clear symptoms, 54 were hospitalized, 17 were critical, and 11 died.[8]

Useful descriptions of how to produce nerve weapons are available on the Internet and in a number of extremist handbooks. Most chemical weapons can be produced by a sophisticated terrorist. The basic technologies for first generation weapons are now more than 80 years old and some—like mustard gas—have persistent effects that may make them more attractive for terrorist purposes than more lethal, but short lived, agents like Sarin. The production of most chemical weapons is very similar to the production of other chemical processes and compounds that are common in the Middle East. Even Sarin is scarcely a complex product. In broad terms, it is a combination of sodium fluoride, isopropyl alcohol, and methyl phosphonic dichloride.

Both weapons and commercial equipment can use the same reactor vessels, distillation columns, heat exchangers, pumps and valves, and filters. In fact, the greatest similarities between weapons and commercial processes exist between second generation nerve gases and insecticides, because the compounds are so closely related.[9] While the Australia Group has created a list of equipment requiring special consideration—emphasizing corrosion resistant equipment using Hastelloy and high nickel alloys—the limited controls over such equipment are designed largely to deal with military-scale production. Further, the required equipment is available from a wide range of countries.

A terrorist might also accept the risk of limited production without such equipment on the grounds that corrosion would not be quick enough to affect the production of limited amounts of agent. Similarly, the list of 54

precursor chemicals now used by the Australia Group is not exclusive—particularly if the terrorist accepts unstable weapons with limited shelf lives and uncertain lethalities—and often has no impact in restricting small purchases and deliveries.[10] There are also indicators that experts from the FSU have been involved in schemes to sell weapons technology and feedstocks. For example, the Russian Federal Security Service has announced that Anatloy Kuntsevich, a retired Soviet Lieutenant General, arranged for the delivery of 1,800 pounds of chemical to an unidentified Middle Eastern country in 1993.[11]

Terrorists might also use toxins, a category of weapons that falls into a gray area between chemical and biological weapons and which can be an order of magnitude more lethal than nerve gas. Toxins are poisonous compounds produced by living organisms like microbes, snakes, spiders, sea creatures, and plants, and are usually proteins that act upon specific receptors in the body. Most are relatively unstable in the presence of heat and other severe environmental factors. However, two toxins—Botulin and Ricin—are comparatively easy to make. The manufacture of Staphylococcal Enterotoxin may be within the capabilities of Middle East terrorists. The production of lethal mycotoxins and saxitoxin is more questionable.

Botulin is particularly lethal, although it still does not compare in lethality with biological weapons. It takes 512 kilograms of Botulinium to produce 50 percent casualties in a 1.5 square kilometer target versus only 0.09 kilograms of Anthrax spores. It is also difficult to produce a dried Botulinium toxin in a form that could be disseminated over a large area in lethal concentrations, and such an attack is probably beyond the capabilities of any Middle Eastern terrorist without state support.

Nevertheless, wet Botulin agents can easily be produced by altering food processing equipment and using milk products and other foods and then spread through a closed area using a standard commercial fogger. One simulation

indicates that Botulin could be grown in garbage cans in a large office building and dried for later dissemination through its air system. Botulin poisoning is difficult to treat effectively and its symptoms only begin to appear 24 hours to several days after an attack. These symptoms can be similar to those of nerve agents—leading to the wrong treatment, particularly if a "cocktail" of different agents is used.

Ricin is even more difficult to weaponize in a form with area coverage than Botulin, but it can be produced using ordinary kitchen equipment. In fact, the Fort Detrick patent for producing Ricin from the Castor Bean has been a matter of public record since 1962. Two members of an American extremist group, a drug group, and a private individual have already shown that a very small group of terrorists can successfully produce Ricin, and that effective treatment is even more difficult.

There are a number of other toxins that might be used. For example, Staphylococcal Enterotoxin is more of an incapacitating agent than a killing mechanism, but terrorists could credibly manufacture and use it in some scenarios. The possible manufacture of mycotoxins has also been a subject of considerable controversy for years. For example, the U.S. State Department has accused the Soviet Union of using such agents in Afghanistan and Vietnam, only to have many U.S. experts immediately state that the evidence was lacking and that it would be almost impossible to create mycotoxins with the required lethality and dissemination characteristics.[12]

The range of potential chemical agents and their uncertain lethality also interacts with the difficulty of detection and defense. Even a Middle Eastern government that sought to prepare a detection and reaction system would face major problems. A terrorist who attacked inside the target area, under conditions where major civil defense measures had not been taken, would probably succeed in achieving his goals before a government could detect the

fact its population was under attack. Deploying detection systems that can provide timely warning over a large urban area, or which cover all area targets is costly—if not impossible. Installing detection devices in all major buildings and enclosed areas is almost certainly impossible.

Many current detection devices are false alarm prone, and a terrorist could destroy the credibility of such warning systems by releasing trace amounts of an agent near such devices at intervals before an attack. Many devices only work with a limited list of chemical weapons, and advanced detection devices are only now becoming available. For example, the United States is just beginning to field test the Automatic Chemical Agent Detector and Mark 21 Remote Sensing Chemical Agent Alarm in an effort to deploy systems capable of real-time detection of chemical attacks on at least point defense basis.[13]

Even an alerted population could remain vulnerable. Many Middle Eastern governments simply cannot afford civil defense, and the terrorist would have the advantage in choosing the place and time of attack. In many cases, governments cannot take civil defense measures without making their strengths and weaknesses public. Slow acting weapons like toxins would present major problems in terms of protection. Agents like dusty mustard can defeat most of the gear available for civil protection. A terrorist might also "spoof" a government into taking civil defense measures that would soon lose their credibility or into triggering the mass use of antidotes which are themselves terrorizing and debilitating, such as Atropine as an antidote for nerve gas.

All major Middle Eastern states are highly dependent on a large volumes of imports, and many of the feedstocks necessary for chemical agents are available as dual-use civil goods. Small amounts of critical specialized feedstocks would be relatively easy to smuggle in using containers or a variety of credible covers. Other agents could be manufactured in place. Drug smuggling is only one example of how difficult it is to establish a perimeter defense of a

country or populated area, and there are serious questions as to whether most of the high technology devices on the drawing board can ever handle the required volume of search with any cost-effectiveness and reliability.[14] In short, it has yet to be demonstrated that any mix of potential technologies would be a cost-effective defense system, and Israel may be the only Middle Eastern state with the mix of resources and technical training capability necessary to credibly consider deploying such detection systems.

Terrorism and Biological Weapons.

Biological weapons represent the most dangerous risk of a "paradigm shift" in Middle Eastern terrorism. They offer a far more devastating option than chemical weapons at costs far lower than those of both chemical and nuclear weapons. The costs of biological weapons are much smaller per casualty than those of any other form of terrorism. A U.N. report estimated in 1969 that military-scale biological weapons only cost $1 per square kilometer of coverage of a civilian target versus $600 for chemical weapons, $800 for nuclear, and $2,000 for advanced conventional weapons. While terrorists can scarcely expect similar production efficiencies and economies of scale, the savings would be roughly proportionate.[15]

Once again, such risks must be kept in perspective. Advanced biological weapons have never been used successfully in combat, and most terrorist attempts to develop and use such weapons have failed. While some intelligence services have used biological weapons and toxins as poisons, there are no confirmed cases in which this had taken place in the Middle East. Similarly, a recent survey of reports on terrorist possession or use of biological weapons indicates that no significant incidents have involved movements in the Middle East, and most such charges that Middle Eastern terrorist groups were involved in such activities were made for propaganda purposes.[16]

At the same time, biological weapons are an extremely serious *potential* threat. Advances in commercial chemical and food processing equipment, and in biotechnology and medical equipment, are making it steadily easier and cheaper to produce effective weapons. Appendix B shows that Middle Eastern states are steadily improving their capability to help proxies or conduct state terrorism, and the fact that at least some controls exist on chemical and nuclear technologies will tend to push terrorists towards biological weapons.[17]

The technology of biological weapons also presents serious problems for detection and defense. One of the greatest problems in dealing with biological terrorism is that there is such a long list of possible weapons with so many different characteristics and effects. Biological weapons have radically different lethalities and area effects, and the lethality of a weapon does not necessarily correspond to its area coverage. For example, if one assumes that a crop spraying helicopter, an RPV, or small aircraft released 50 kilograms of a Rift Valley Fever agent along a two-kilometer line upwind of a city of around 500,000, the resulting agent would be heavy enough so that it would only reach about one kilometer downwind. It also would probably only kill 400, and incapacitate 35,000.[18]

In theory, a terrorist could credibly produce and use any of these weapons—particularly if a state granted the terrorist group sanctuary, a secure facility, and/or state support. Doctors, laboratory technicians, and cultists in the U.S., Britain, France, Japan, Haiti, and India have used biological poisons, and Aum Shinrikyo carried extensive work in developing Botulinum toxin and Anthrax.

U.S. studies and exercises have shown that the open literature and commercial equipment are adequate for such purposes—particularly if the agent does not have to be stored in a stable form or weaponized. The terrorist would also have the advantage that laboratory or pilot scale production of 50-500 liters of agent would be adequate for

many types of terrorist attacks, and would involve far less detectable purchases of equipment and production efforts than commercial scale production of weapons using equipment with a capacity of over 500 liters. While there are some guidelines for identifying dual-use biological equipment and related technology, there also are literally hundreds of suppliers scattered all over the world, and existing guidelines emphasize large-scale or highly specialized equipment that terrorists either would not need or could buy with little fear of detection using different covers and suppliers.[19]

The need for a special facility would vary sharply according to the agent used. Anthrax and Botulin, for example, could be produced safely in a comparatively unsophisticated level 2 facility with only limited special containment equipment. A terrorist might also use a university or small company laboratory as a cover to produce a more pathogenic agent, or accept the risk of relatively low levels of protection against accident. Both approaches would be less detectable than the level 3 or level 4 production in a secure military facility that a government might insist upon.

A wide range of different fermentation equipment might be used, and standard commercial fermenters could be adapted for either batch or continuous fermentation. Anthrax, for example, might be produced on a one batch process from a commercial fermenter, and the facility might then be abandoned. Some of the largest fermenters are used for the production of microbial products for animal feeds. Controls are only beginning to be applied to the international sale of type cultures and most such controls offer little real security. A number of organisms can also be isolated from the environment in the Middle East, stolen or traded, or obtained in exchanges from a variety of laboratories other than type culture centers. The technology and equipment for genetic engineering is becoming commercially available, and a terrorist might lease such facilities in Europe or the U.S.[20]

A terrorist might also steal a virus from a government facility. Such facilities sometimes offer immediate access to very dangerous agents. For example, an Ebola virus incident occurred by accident in Reston, Virginia, in December 1989. Fortunately, the Ebola turned out to be a strain which was only fatal to monkeys. However, there is no guarantee that a targeted attack on a medical research facility would not give a terrorist access to a far more lethal weapon. Ebola outbreaks involving human beings have a history of 53 percent to 92 percent mortality, and there are at least five other viruses with similar lethality that might be stolen or cultured to produce a weapon.[21]

Once again, however, such potential threats must be placed in a real-world context. It must be stressed that there are few cases where biological terrorist activity has been attempted, and none which have conclusively demonstrated that a terrorist can actually achieve high lethalities. There are also significant technical difficulties in weaponizing biological agents to achieve high casualties. It is difficult for terrorists to develop dry agents that can be scattered in the air, kill through inhalation, and which have just the right size and weight to ensure both proper concentration and proper lethality. Effective weapons use droplets smaller than 10 microns, and the effectiveness of most weapons is measured in terms of the number of infectious units that can be released of 1-5 micron size. The production of lethal agents also usually requires a significant amount of equipment and time, although the processing equipment involved is becoming steadily cheaper. The only way to be certain of lethality is through experimentation with live subjects—although this might be done with limited risk of detection by "mini-attacks" on selected individuals.

One thing is clear. If terrorists are successful in producing or obtaining a highly lethal biological agent, the payload involved could be so small that it would be easy to deliver much larger amounts than the 50 kilograms discussed in Table 7, or to deliver a mix of agents with radically different effects and treatments and do so in a

relatively small delivery system. Many agents listed would be equally effective if scattered from a ship, from a truck, or off the top of several tall buildings. The U.S. Army, for example, has tested the scattering of Anthrax-like particles from a ship off the coast of Atlantic City, on commuters in Grand Central station, from the back of trains, and in a covert attack on Egland Air Base. All four simulated attacks were conducted without any questions or challenges, and gathering of particles from test subjects showed that they would have had high lethality.

Line source delivery does not require an aircraft or platform detectable by radar, and the urban sprawl of cities means that sufficient high rise buildings exist so that a terrorist could select three or four buildings, take a suitcase or trunk to the roof, release the agent an optimal distance from the main area of attack and leave. Alternatively, a wet agent and nebulizer/fogger could be moved to the roof disguised as cleaning equipment or some other service device. Further, security against this form of attack would not affect using a truck or vehicle in a more open area and no current detection device could prevent exposure. Even the new U.S. Interim Biological Agent Detector (IBAD), for example, takes at least 45 minutes to detect and analyze an agent—provided it is set to recognize the agent used. The first real field tests of this system are underway in South Korea.[22]

Terrorists could also use much less ambitious forms of biological warfare. One American in Fairfax, Virginia, for example, exploited the fear of biological weapons by spraying liquid over his neighbors and telling them they had been infected with anthrax. While this case borders on the absurd, a terrorist could cause a great deal more fear by using an actual agent in nonlethal amounts or inserting detectable amounts of agents into a water system and making the action public. While most agents are ineffective once sent through water purification systems, this fact is not known to most physicians and the announcement could cause considerable disruption. Similarly, agricultural

exports can be disrupted by contamination of food with toxins or pathogenic agents (this was done with Chilean grape exports to the U.S.). Medical and other widely used consumer goods could also be tampered with in the target country (done with Tylenol in the U.S., and threatened against Pepsi Cola).[23]

In short, the problems of detection, defense, and response would be even more difficult than in dealing with chemical weapons, and the risk of a breakdown or collapse of national emergency and medical services would be much greater. Effective surveillance of known potential facilities would be extremely difficult for all of the Middle Eastern states with modern research and food processing facilities, and tracking all relevant imports would be almost impossible. Detection and warning systems would be even more prone to false alarms, the use of "cocktails," and gaps in coverage. Even effective systems would at best provide medical and emergency response teams with warning of the protection methods they should use and the need for immediate treatment. As a result, more might depend on the willingness of the terrorist to kill than on a Middle Eastern government's effort to detect and defend.

Terrorism and Nuclear Weapons.

Nuclear weapons are simultaneously the most threatening weapon terrorists might use and the most difficult weapon for terrorists to obtain. Most nuclear weapons are extremely sophisticated devices requiring extremely advanced machining, electronics, and safety procedures during their manufacture and handling. They are far more expensive, and much more difficult to manufacture. They sometimes involve detectable levels of radiation, and are much heavier than biological weapons.

Single gun devices are the least sophisticated nuclear weapon that a Middle Eastern terrorist might assemble. It is possible to use conventional ordnance technology in assembling the mechanism and fabricating the explosive for

such a weapon. Commercial industrial techniques can be used to manufacture a tungsten or tungsten carbide reflector, and a neutron initiator can be made if a modest reactor is at hand for polonium production. A gun weapon could do without such a device and could even use near weapons grade levels of enrichment at the cost of lower yields and increased risk of misfires and partial fission.[24]

At the same time, even single gun devices still require relatively sophisticated neutron reflectors. They are extremely heavy relative to implosion weapons, and are wasteful of enriched material. For example, an efficient implosion weapon with a 10-15 kiloton yield might use only 6-8 kilograms of plutonium, while even an efficient version of a single gun device using weapons grade plutonium might use 60 kilograms and require machining down from a total of 70-90 kilograms. Further, an effective gun device must use weapons grade U-235 or U-233 and cannot use plutonium. Weapons grade plutonium is more common and easier to process, and the fact that gun devices must use uranium will restrict terrorist capability to actually manufacture a weapon.[25]

Implosion weapons are more efficient, but are far more complex to design and manufacture—even if weapons grade uranium or plutonium is available. The two principal problems are the development of an effective implosion system and a suitable neutron initiator. The basic techniques and designs necessary to solve both problems are well-known, but actually designing a reliable weapon and fabricating working components is still extremely difficult and is likely to require either a large, high-technology clandestine organization or a state-sized entity.

High efficiency implosion devices are even more sophisticated and require the design to maximize the compression of the fissile material by using a levitated core, or flying plate design, with a sufficiently high HE/driver mass ratio to achieve velocities approaching the theoretical limit. This requires techniques such as the use of an efficient

tamper and reflector (preferably nonmoderating); the use of a composite core (if two different fissile materials are isotopes); and fusion boosting.[26]

Building a weapon with minimal fissile material and no testing also imposes serious constraints. Reducing the amount of fissile material diminishes yield and further increases the risk of failure without testing or types of simulation that normally require a state-sized entity. The mass of the implosion system, and the tamper/reflector must be increased, which will result in greater overall mass and volume, even though the fissile material weight is reduced.

The only variation in weapons design that seems to offer a terrorist the ability to use minimal amounts of fissile material is an advanced flying plate design that would compress a one kilogram plutonium mass sufficiently to produce a yield in the 100 ton range. This design, however, places important limits on the type of fissile material that can be used. The high compression required implies fast insertion times, and relatively pure weapons grade plutonium.[27]

At the same time, one should not exaggerate the difficulties. Several trials have shown that a number of graduate physicists could design workable gun type weapons that could be assembled using commercially available parts, explosives, electronics, relatively small facilities, and readily available tools. There are weapons designs that can use a higher plutonium-240 content than normal weapons grade plutonium without affecting performance. In fact, ordinary reactor grade plutonium can be as effective as weapon grade material in some very low yield weapons. While it seems unlikely that terrorists can ever hope to make such a weapon, fusion boosting would allow low-enrichment weapons to produce yields exceeding 1 kiloton.

While it is also extremely unlikely that anything smaller than a state-sized entity could produce weapons grade

plutonium or uranium, massive amounts of fissile material exist in the Former Soviet Union, as do thousands of relatively small nuclear weapons. In late 1995, Russia had a stockpile over 1,200 tons of highly enriched uranium and 150 tons of weapons grade plutonium, the Ukraine recently had a stockpile of 100 kilograms of highly enriched uranium, and Kazakhstan has a stockpile of 300 kilograms of highly enriched uranium and 100 kilograms of weapons grade plutonium. The FSU was also operating 46 commercial power reactors which produce plutonium-239 as a byproduct. While extracting this plutonium-239 requires complex and dangerous processing, no developing nation that has ever attempted to acquire such technology has failed, and a number of facilities in Russia could perform the task.

Nations like China and Pakistan might also be the source of such material, but the FSU stands out because it already has a substantial nuclear black market. Work by the CSIS Global Organized Crime Project indicates that Russian law enforcement agencies dealt with 21 cases of theft of fissile material (some enriched) between mid-1992 and mid-1995, and prosecuted 19 Russian citizens.

The Russian Ministry of the Interior reported 27 cases of theft in 1993 and 27 in 1994—all by Russians inside the apparatus for producing and securing such material. There were five recoveries of small amounts of weapons usable (87 percent enriched) uranium in 1994, although the largest recovery totaled only 2.7 kilograms. Germany investigated 158 cases of nuclear smuggling in 1992, 241 in 1993, and 267 in 1994, and German officials estimated that at least half of these cases involved smugglers with some access to real radioactive materials. In contrast, the United States has had only one confirmed case of domestic nuclear smuggling or extortion involving actual nuclear material out of the 100-odd cases it has investigated over the last 20 years.

Nuclear smuggling also involves far more serious risks than the transfer of fissile material. The FSU recently had

nearly 30,000 nuclear weapons, and the problem terrorists face would be greatly eased if one or more nuclear weapons which are already assembled became available. There seems good reason to question whether the safety devices on most FSU weapons—particularly tactical weapons—would be as difficult to defeat as those on most U.S. weapons. In any case, the safety devices on most nuclear weapons are not intended to protect them against weeks or months of dedicated effort by trained engineers and physicists. Access to several weapons of the same type would allow the terrorists to disassemble one to determine the exact nature of the weapon's safety and protection system and then develop the best way of bypassing such protection in the other weapons. In some cases, it might be possible to substitute new components for protected components, though possibly at the cost of reliability or yield.

Delivery of smuggled or stolen nuclear weapons would not require a sophisticated military delivery system. Even a large gun type device could be easily moved in a truck or small ship, and a fully shielded Russian designed nuclear weapon could be shipped in a relatively small container weighing less than 500 kilograms. The terrorist would also have several potential advantages in the delivery of a weapon that are not available to a state making a military attack. A sophisticated terrorist can chose the exact time and place of attack, can chose the moment for maximum political or escalatory provocation or when civil defense and emergency response measures are unprepared.

Once again, one has to be careful about treating state terrorism or nonstate terrorist groups as mass murderers.[29] However, it is at least possible that a Middle Eastern terrorist group might see the fallout from a ground burst as a significant bonus from an attack. A terrorist could also map a city or area target with great precision. Like terrorists using chemical and biological weapons, terrorists using nuclear weapons can now draw on sophisticated weather and wind data to chose the optimal moment of attack. Wind patterns can be confirmed or monitored very

cheaply using remote devices linked to the Internet or cellular phones. The vast uncertainties that military planners face in dealing with collateral damage from the long-term death rate from fallout and rain out (or underwater/surface explosions) may have little meaning to terrorists who may want massive casualties to die slowly and agonizingly over a period of decades and wounded societies which must endure the human consequences. A terrorist willing to kill a hundred thousand people with the prompt effects of nuclear weapons is unlikely to harbor humanitarian niceties about longer term deaths.

A terrorist does not have to use high yields to deal with uncertainties in accuracy, and it is important to understand that the effects of even small nuclear weapons are extremely severe. Table 7 shows that a 10 kiloton weapon has roughly 25 percent to 33 percent of the blast and thermal effects of a 100 kiloton weapon that is 10 times larger. While it is impossible to quantify fallout effects in equally simple terms, an urban ground burst from a 10 kiloton weapon might well produce fallout equal to 40-50 percent of that of a 100 kiloton weapon. A well-designed exploitation of its fallout pattern would probably produce a prompt and long-term death rate in excess of 20-30 percent over the greater Riyadh, Amman, Cairo, or Tel Aviv areas. It is also possible that a terrorist might increase the radiological fallout from such a weapon by packing it, or adapting its tamper, to use a nonweapons grade fissile material like uranium-238 or plutonium-240.

There are no precedents for knowing what would happen to a Middle Eastern state whose major population center took both devastating immediate losses and then would have to deal with the longer-term medical consequences over a period of 20 years or more. There is no way to know how much of its ruling elite would be lost, how its people would deal with the political and economic shock, what the impact would be on immigration and emigration, and how it would deal with decontamination and rebuilding.

Work done by U.S. and British civil defense planners during the 1950s and 1960s suggests that the technical aspects of recovery could be dealt with relatively rapidly, and the Japanese experience at Hiroshima and Nagasaki indicates that human beings are relatively resilient in dealing with the shock of nuclear attack. Both the civil defense studies and Japanese experience, however, are based on recovery by developed countries with careful planning for recovery—or wartime readiness and preparations—and the existence of a stable national political structure and a relatively unified political system.

There also is a significant possibility that a terrorist nuclear device could explode in ways that involved little planning by the terrorists involved. Under some conditions this could lead to a misfire or explosion in an area where the weapon would do comparatively limited damage. Under other conditions, it could vastly complicate the already unpredictable political and strategic consequences of a terrorist use of nuclear weapons. A nuclear device is inherently unstable. It must bring fissile material into near proximity for critical mass and be surrounded by high explosives. A one-of-a-kind explosive device may detonate by accident—as a have many terrorist bombs.

A stolen nuclear weapon whose safety devices are bypassed by terrorists is scarcely a secure system for transit or cargo purposes, and a stolen high efficiency design might be vulnerable to sudden core collapse. Terrorists may ignore or fail to understand fallout patterns which can easily reach across borders, and explosions can produce skip effects where winds and weather lift up fallout and deposit it in lethal concentrations and up to several hundred kilometers away. The impact of an explosion in Jerusalem that terrorists had intended for Tel Aviv is just one of the countless “wild card” cases that might occur.

Finally, terrorists can use nuclear materials in other ways. Most radiological weapons do not offer the extreme lethality of biological weapons and are closer to chemical

weapons in lethality. It is also difficult to manufacture weapons with wide area coverage, which present the same general problems as manufacturing very small particles as biological weapons, and the manufacture of such weapons would be easier to detect at a distance. Highly sophisticated plutonium particulates that could be delivered like Anthrax spores would be an extraordinarily dangerous weapon to manufacture and handle. However, the inhalation of even trace amounts of plutonium would cause an agonizing death, and plutonium-240—a nonfissile material—would be as lethal as plutonium-239.

Terrorists might exploit their very possession of nuclear materials. For example, terrorists may acquire a credible capability to threaten the use of a nuclear device long before they actually possess a working nuclear weapon—if they ever acquire one. A nation that detects the transfer of a large amount of fissile material or smuggled weapon—and/or the acquisition of materials for making a weapon—will be vulnerable to threats and blackmail and will have to take Draconian security measures to have credibility for dealing with the attack.

The mere existence of a credible threat could provide terrorists with a high degree of leverage in some contingencies and change the rules for dealing with such groups and counterterrorist activity. Terrorists are as capable of preemption, or "launch under attack," as states. As is the case with highly lethal biological agents, states would be confronted with the risk that counterterrorist activity could trigger an unacceptable act by the terrorist group that the state was attempting to counter.

The final technical dimension shaping nuclear terrorism is the risk of nuclear cocktails that mix radiological poisons with biological and chemical weapons or very large explosive devices. Terrorists seeking to complicate and/or kill emergency response efforts might add radioactive contaminants to other weapons knowing that—at a minimum—even limited levels of radiation can cause panic

and disrupt efforts to deal with other forms of damage. Mixing types of weapons could also greatly complicate decontamination, further weaken the credibility of announcements that an area or facility is safe, and force governments to deal with lingering after effects and investigations that stretch out the public impact of an act of terrorism for months or years. As has been discussed in Appendix E, this could lead to attempts to use radiological agents against military facilities with U.S. or local military personnel as well as civil targets.

Once again, one cannot discount the resulting problems of contamination and fear. Most radiological poisons may be no more lethal than a host of other killing mechanisms, but radiation inspires the same unique level of fear as an exotic disease. Even trace amounts of radiation can inspire high levels of fear and trigger massive security measures and decontamination exercises. There is little authoritative basis for deciding what level of exposure is or is not safe and what level of decontamination is successful. Even when Middle Eastern governments can declare that a radiation level is safe, they are not likely to encounter trust and public confidence. Combined with the long half-lives of many radioactive agents, this could make even radiological weapons that have little lethality potentially effective as panic and facility/area denial weapons.

Detection, defense, and response would again present problems. As has been discussed earlier, coastal facilities can be attacked without a weapon formally entering national territory and container shipments would have to be inspected outside ports to prevent the shipment of booby-trapped devices. While airport detectors, vehicle monitoring detectors, and area search equipment are likely to be more effective than the equipment available to deal with chemical and biological weapons, it may be possible for terrorists to effectively shield radioactive material, and detection of a single weapon in maritime cargo would be uncertain without on-ship inspection.

Few Middle East countries can hope to acquire the capabilities and technical support of the U.S. Nuclear Emergency Situation Team (NEST). Even U.S. experts would find it difficult to quickly characterize a given radioactive contaminant and decide on a decontamination strategy. A terrorist presumably would time an attack to avoid any effective civil defense and evacuation measures—which would differ in detail from the measures required to defend against biological and chemical attack. The treatment of nuclear weapons effects would require massive medical capabilities to deal with direct physical injury from blast, burns, and radiation poisoning and might quickly saturate regional response capabilities. Triage, the fear of further attacks, and the psychological/physiological impacts of radiation would further expand the social and political impact of nuclear weapons.

Terrorism and Counterproliferation in the Middle East.

There is no way to put an analysis of truly horrifying possibilities without clear probabilities into perspective. There is no way to distinguish the "boy who cried wolf" from "chicken little," and either from a rational warning. It should be obvious, however, that nations inside and outside the Middle East must begin to consider terrorism and unconventional warfare as potential means of delivery of weapons of mass destruction and as independent causes of proliferation.

The costs of a "paradigm shift" in terrorism to the use of weapons of mass destruction are so high that any structure of regional arms control and defense that ignores such risks leaves gaping holes and vulnerabilities. There is no point, for example, in creating a vastly expensive missile defense system to deal with a vastly expensive missile threat and then leave a nation vulnerable to terrorism and unconventional warfare. The end result is simply to create a major new incentive for such attacks and state-sponsored terrorism.

It requires regional states and their allies to consider adapting a suitable mix of force improvements of the kind listed in Appendixes F and G, which are adapted from the U.S. counterproliferation program. These appendixes also illustrate the practical challenges friendly Middle Eastern states will face in dealing with the combined mix of threats from the military forces of hostile states, state terrorism, and independent terrorism. It is important to stress that threatened states cannot afford to focus on one aspect of the threat of weapons of mass destruction, any more than they can afford to ignore the need to maintain and improve their capability to deal with more conventional threats.

This list of policy and force improvements also illustrates the real-world problems that Middle Eastern governments are likely to have in dealing with a range of problems that is an exercise in complexity or "chaos" theory. Any review of the literature on the threat of terrorism from weapons of mass destruction quickly reveals a wide range of individually useful suggestions—in addition to a wide range of "scare" suggestions and "sales pitches."

The problem lies in determining how a developing Middle Eastern state—even one as advanced as Israel—can combine a suitable mix of measures to cover the unique terrorist threat from all weapons of mass destruction along with the need to respond to all other threats. Counter-terrorist experts may be able to focus on their specialty and avoid the kind of ruthless trade-offs discussed earlier, but governments must use limited resources to deal with *all* the risks they face.

There currently do not seem to be good or cost-effective answers to dealing with this problem. In fact, one is sometimes reminded of the Chinese proverb, "No solution. No problem!" There are, however, several key starting points:[30]

- National and international intelligence and counterterrorist experts, involved in concert with

technical experts and emergency and medical personnel, need to begin to fully study the risks. At a minimum, intelligence efforts need to be refocused to train personnel to recognize long-term and technical indicators, and to provide strategic warning of a paradigm shift in regional terrorist activity to focus on weapons of mass destruction. This effort must break down internal bureaucratic barriers to coordination, over-compartmentation of security, and a tendency to suboptimize around known terrorist groups and a particular set or type of weapon of mass destruction.

- Study is needed of existing medical and emergency response capabilities—including civil defense and public warning—to determine what low cost steps can be taken. At the same time, some form of emergency response team should be established that can begin to improve detection and response capabilities and which can coordinate efforts to deal with the combined nuclear-biological-chemical threat. A clear concept of emergency and medical response operations should be developed to use existing resources effectively, avoid the self-destruction of the medical and emergency response effort, and establish priorities for investment in a balanced overall response effort.

- The United States and other states with advanced counterproliferation programs and medical capabilities need to begin planning for the transfer of suitable intelligence, detection and warning systems, and emergency response aid. The developing states of the Middle East have little prospect of cost-effectively evaluating all of the possible approaches and technologies. Massive outside medical and emergency response aid may often be the only way in which a developing state can ever deal with an effective terrorist attack using such weapons.

- Technology transfer control efforts outside the Middle East need to be restructured to explicitly consider terrorism, and not simply the creeping proliferation in regional military forces.

- Regional and outside states need to recognize that arms control and counterproliferation efforts cannot be divorced from counterterrorism, or focused on one weapon of mass destruction. Any such arms control efforts virtually create a vacuum or gap that serves as an incentive for terrorist or unconventional attacks that exploit the weaknesses or rigidity in the arms control regime.

That said, it is difficult to dismiss the probability that governments will only really begin to react after one or more terrorists demonstrate that the possibility of such terrorism is an actual fact. Governments do not do well with paradigm shifts, and the sheer complexity of the potential threat makes a response even more difficult. In practice, one can only hope that Middle Eastern terrorists continue to have mediocre competence, are slow to take advantage of such options, are noisy enough to provide considerable strategic warning, and that the price tag of their initial strikes is low enough so that the resulting casualties and damage are an acceptable form of the unacceptable.

CHAPTER 7 - ENDNOTES

1. In spite of extensive research dating back to the nuclear attacks on Japan, estimates of fallout effects vary so sharply by source that it is virtually impossible to model a credible estimate of the impact of fallout on long-term death rates. It is obvious that fallout immediately down wind of an explosion will produce a high number of casualties within a month of an explosion, but it is extremely difficult to generalize as to how many will die. The problem of longer-term deaths is almost impossible to estimate because studies produce such different estimates of the added impact of radiation-related cancer, leukemia, and other diseases and because the long-term death rate will apply to the entire life expectancy of those exposed and to some of their children. As a result, most recent nuclear weapons effects studies caveat their

estimates by saying they only include prompt casualties. Such estimates are suitable for military purposes because few attackers would deliberately use ground bursts on an urban or densely populated target, and the key criteria is prompt damage to the opponents military forces. They are not valid for counterterrorism purposes because the terrorist might see them as a key form of "bonus damage" or even a primary killing mechanism.

2. Testimony of Gordon C. Oehler, Director, Nonproliferation Center, CIA, to the Permanent Committee on Investigations, U.S. Senate, October 31, 1995.

3. The danger inherent in this statement is that terrorists groups have usually been in existence for some time before they acquire the visible profile necessary to be described in documents like the Department of Defense's "Terrorist Group Profiles" and in the U.S. State Department report on "Patterns of Global Terrorism." By this time, they have acquired some form of bureaucratic structure and "predictability." Further, such unclassified reporting does not report in detail on internal divisions and break away elements, or assess the risk of ultra-extreme movements within such terrorist groups.

4. For more analysis of this issue, see Brian Michael Jenkins, "Future Trends in International Terrorism," RAND Paper P-7139, December 1985.

5. *Washington Post*, September 26, 1998.

6. For additional discussion, see Ron Purver, *Chemical and Biological Terrorism: The Threat According to the Open Literature*, Canadian Security Intelligence Service, June 1995, and Joseph D. Douglas and Neil C. Livingstone, *America the Vulnerable*, Lexington, Lexington Books, 1987.

7. Uniformed Services University of Health Services Report on "Responding to the Consequences of Chemical and Biological Terrorism," July 11-13, 1995.

8. A wide range of conflicting medical statistics have been issued. These are taken from presentations to the Uniformed Services University of Health Services Report on "Responding to the Consequences of Chemical and Biological Terrorism," July 11-13, 1995.

9. CIA Non-Proliferation Center, *The Chemical and Biological Warfare Threat Handbook*, Washington, CIA, 1995, pp. 5-9.

10. "Global Proliferation of Weapons of Mass Destruction," Hearings Before the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, U.S. Senate, October 31 and November 1, 1995, pp. 507-525; CIA Non-Proliferation Center, *The Chemical and Biological Warfare Threat Handbook*, Washington, CIA, 1995, pp. 5-9.

11. AP, October 23, 1995.

12. Uniformed Services University of Health Services Report on "Responding to the Consequences of Chemical and Biological Terrorism," July 11-13, 1995.

13. *Jane's Defense Weekly*, October 9, 1996, p. 5.

14. For a discussion of some of the technical options, see "Briefing, Chemical and Biological Terrorism," *Jane's Defense Weekly*, August 14, 1996, pp. 16-21.

15. Testimony of Lieutenant Colonel Edward Eitzen before the Permanent Subcommittee on Investigations of the Committee on Government Affairs, U.S. Senate, October 31, 1995.

16. W. Seth Carus, *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents in the 20th Century*, Center for Counterproliferation Research, National Defense University, August 1998.

17. For a highly detailed analysis of these issues and global patterns in actual incidents, see *Ibid*.

18. Adapted from testimony of Lieutenant Colonel Edward Eitzen before the Permanent Subcommittee on Investigations of the Committee on Government Affairs, U.S. Senate, October 31, 1995; and *Health Aspects of Biological Weapons*, World Health Organization, 1970. For more detailed descriptions of such effects, see Mark H. Killinger, *Chemical/Biological Incident Handbook*, Seattle, Pacific Northwest Laboratory, 1993; and Harvey J. McGeorge, *Chemical/ Biological Terrorism Threat Handbook*, Woodbridge, Public Safety Group, 1989.

19. See the lists in pp. 533-542 of Hearings Before the Permanent Subcommittee on Investigations of the Committee on Governmental Affairs, U.S. Senate, October 31 and November 1, 1995.

20. CIA Non-Proliferation Center, *The Chemical and Biological Warfare Threat Handbook*, Washington, CIA, 1995, pp. 26-29.

21. Uniformed Services University of Health Services Report on "Responding to the Consequences of Chemical and Biological Terrorism," July 11-13, 1995; CIA Non-Proliferation Center, *The Chemical and Biological Warfare Threat Handbook*, Washington, CIA, 1995, pp. 33-34.

22. *Jane's Defense Weekly*, October 9, 1996, p. 5; "Briefing, Chemical and Biological Terrorism," *Jane's Defense Weekly*, August 14, 1996, pp. 16-21.

23. Testimony of Lieutenant Colonel Edward Eitzen before the Permanent Subcommittee on Investigations of the Committee on Government Affairs, U.S. Senate, October 31, 1995.

24. Adapted from "Nuclear Weapons Frequently Asked Questions," by Carry Sublette, Version 215, August 23, 1996, MILNET—Nuclear Weapons, NFAQ Official Mirror Site.

25. U.S. Department of Energy working estimate.

26. Adapted from "Nuclear Weapons Frequently Asked Questions," by Carry Sublette, Version 215, August 23, 1996, MILNET—Nuclear Weapons, NFAQ Official Mirror Site.

27. *Ibid*.

28. For a detailed description of these risks, see the CSIS Task Force Report, *The Nuclear Black Market*, Global Organized Crime Project, Washington, CSIS, 1996—ISBN 0-89206-287-8.

29. For an interesting discussion of these issues, see Martha Crenshaw (Department of Government, Wesleyan University), "Incentives and Disincentives for Nuclear Terrorism," Presentation to the American Political Science Association annual meeting, August 28-31, 1997.

30. A more detailed list of suggestions applying to the United States can be found in "Terrorism, Weapons of Mass Destruction, and U.S. Security," The Sam Nunn Policy Forum, Athens, Georgia, April 28, 1997.

APPENDIX D

THE CHALLENGE TERRORISM AND UNCONVENTIONAL WARFARE POSE TO THE WEST

- Existing and projected detection and control technologies, arms control proposals, and concepts for missile defense assume that the primary threats are organized states and that relatively large efforts must be used.
- Conventional structures of deterrence assume identifiable and limited sets of opponents and similar values in dealing with issues like mutual destruction. Terrorist movements may be willing to take catastrophic risks, as may leaders who identify themselves with the state and/or see martyrdom as a valid alternative to victory.
- War may not be between states or fought for limited strategic objectives. It may be a war of proxies or terrorists. It may be fought to destroy peoples or with minimal regard for collateral damage and risks.
- The target of unconventional uses of weapons of mass destruction may not be military in the normal sense of the term. It may be a peace process, U.S. commitment to the defense of a given region, a peacekeeping force, an election or ruling elite, or growing cooperation between formerly hostile groups.
- Terrorist organizations have already attempted to use crude chemical weapons. The development and use of chemical and biological weapons are well within the capability of many extremist and terrorist movements, and states can transfer weapons or aid such movements indirectly or with plausible deniability.
- Covert or unconventional delivery means may be preferable to both states and nonstate organizations. Cargo ships, passenger aircraft, commercial vehicles, or commercial cargo shipments can all be used, and routed through multiple destinations. A well-established series of covert transport and smuggling networks exist throughout the region. Biological weapons can be manufactured in situ.

- The Marine Corps Barracks incident has already shown the potential value of "mass terrorism," as has the media impact of the Oklahoma City bombing and the disruptive effect of far more limited events like the suicide bombings by Hamas and the assassination of Yitzak Rabin.
- Biological and chemical weapons present special problems because they can be used in so many ways. Chemical poisons have been used to contaminate Israeli fruit and Chilean food exports. Infectious biological agents could be used to mirror image local diseases, as well as agents with long gestation times. Persistent nerve agents could be used in subways, large buildings, shopping malls/bazaars, etc., to create both immediate casualties and long-term risks. Mixes of biological and chemical agents could be used to defeat detection, protection gear or vaccines.
- Arms control efforts assume large state efforts with detectable manufacturing and weaponization programs in peacetime. The development of a capability to suddenly manufacture several hundred biological and chemical weapons with little or no warning is well within the state-of-the-art using nothing but commercial supplies and equipment, and much of the Research and Development effort could be conducted as civil or defensive research.
- Unconventional and terrorist uses of weapons can involve the use of extremely high risk biological weapons transmitted by human carriers, commercial cargoes, etc.
- The incentives for the unconventional use of weapons of mass destruction increase in proportion to the lack of parity in conventional weapons, the feelings of hopelessness of alienated or extremist groups, or the prospect of catastrophic defeat.
- Similarly, the incentive for the unconventional use of weapons of mass destruction will increase in direct proportion to the perceived effectiveness of theater missile and other regular military defense systems.
- Rogue operations will be a constant temptation for state intelligence groups, militant wings of extremist groups, revolutionary forces, etc.

APPENDIX E

ATTACK SCENARIOS: "DR. BEN NO" AND "PROFESSOR ABU MORIARITY" AT WORK IN THE MIDDLE EAST

- A radiological powder is introduced into the air conditioning systems of high-rise office buildings or hotels. Symptoms are only detected over days or weeks, or public warning is given several weeks later. The authorities detect the presence of such a powder, but cannot estimate its long-term lethality and have no precedents for decontamination.
- Parts for a crude gun-type nuclear device are smuggled in. The device is built in a medium sized commercial truck. The target area is mapped to maximize fallout effects in an area filled with buildings with heavy metals, and the terrorists wait for a wind maximizing the fallout impact. The bomb explodes with a yield of only 8 kilotons, but with an extremely high level of radiation. Immediate casualties are limited but the long-term death rate mounts steadily with time.
- Several workers move drums labeled as cleaning agents into a large shopping mall, large public facility, subway, train station, or airport. They dress as cleaners and are wearing what appear to be commercial dust filters or have taken the antidote for the agent they will use. They mix the feedstocks for a persistent chemical agent at the site during a peak traffic period. Large scale casualties result, and draconian security measures become necessary on a national level. A series of small attacks using similar "binary" agents virtually paralyze the economy, and detection is impossible except to identify all canisters of liquid.
- Immunized terrorists penetrate a large Western cruise ship or combat ship. They carry anthrax powder in bags designed to make them appear slightly overweight. They slowly scatter the powder as they walk through the ship visit. The immediate result is 50 percent casualties among the ship's crew, its marine complement, and the visitors that follow. There is only uncertain ability to decontaminate a large ship where anthrax has entered the air system and is scattered throughout closed areas. After long debates over methods and safety levels, the ship is abandoned.

- A terrorist seeking to "cleanse" a Western nation of its secular regime and corruption introduces a modified type culture of Ebola or a similar virus into an urban area—trusting God to "sort out" the resulting casualties. He scatters infectious cultures in urban areas for which there is no effective treatment. By the time the attack is detected, it has reached epidemic proportions. Medical authorities rush into the infected area without proper protection, causing the collapse of medical facilities and emergency response capabilities. Other nations and regions have no alternative other than to isolate the nation or center under attack, letting the disease take its course.

- A terrorist group modifies the valves on a Japanese remote-controlled crop spraying helicopter which has been imported legally for agricultural purposes. It uses this system at night or near dawn to spray a chemical or biological agent at altitudes below radar coverage in a line-source configuration. Alternatively, it uses a large home-built RPV with simple GPS guidance. The device eventually crashes undetected into the sea or in the desert. Delivery of a chemical agent achieves far higher casualties than any conventional military warhead. A biological agent is equally effective, and the first symptoms appear days after the actual attack—by which time treatment is difficult or impossible.

- A truck filled with what appears to be light gravel is driven through the streets during rush hour or another maximum traffic period. A visible powder does come out through the tarpaulin covering the truck, but the spread of the power is so light that no attention is paid to it. The driver and his assistant are immunized against the modified form of Anthrax carried in the truck which is being released from behind the gravel or sand in the truck. The truck slowly quarters key areas of the city. Unsuspected passersby and commuters not only are infected, but carry dry spores home and into other areas. By the time the first major symptoms of the attack occur some 3-5 days later, anthrax pneumonia is epidemic, and some septicemic anthrax has appeared. Some 40-65 percent of the exposed population dies, and medical facilities collapse causing serious, lingering secondary effects.

- A terrorist group scatters high concentrations of a radiological, chemical, or biological agent in various areas in a city, and trace elements into the processing intakes to the local water supply. When the symptoms appear, the terrorist group makes its attack known, but claims that it has contaminated the local water

supply. The authorities are forced to confirm that water is contaminated, and mass panic ensues.

- Immunized terrorists carry small amounts of anthrax or a similar biological agent onto a passenger aircraft like a B-747, quietly scatter the powder, and deplane at the regular scheduled stop. No airport detection system or search detects the agent. Some 70-80 percent of those on the aircraft die as a result of symptoms that only appear days later.

- Several identical nuclear devices are smuggled out of the FSU through Afghanistan or Central Asia. They do not pass directly through governments. One of the devices is disassembled to determine the precise technology and coding system used in the weapon's PAL. This allows users to activate the remaining weapons. The weapon is then disassembled to minimize detection with the fissile core shipped covered in lead. The weapon is successfully smuggled into the periphery of an urban area outside any formal security perimeter. A 100-kiloton ground burst destroys a critical area and blankets the region in fallout.

- The same device is shipped to a Western port in a modified standard shipping container equipped with detection and triggering devices that will set it off as a result of any security checks. Its main "guidance" system is a GPS system that sets it off automatically when it reaches the proper coordinates in the port of destination. The direct explosive effect is significant, but "rain out" contaminates a massive local area.

- A freighter spreads anthrax along a coastal area in the Gulf. It is several days before the attack is detected, and the attacking group is never fully identified. The form of anthrax involved is dry and time encapsulated to lead to both massive prompt casualties and to force time consuming decontamination.

- A terrorist group attempting to drive Western influence out of Saudi Arabia smuggles a large nuclear device into Al Hufuf on the edge of the Ghawar oil field. It develops a crude fallout model using local weather data which it confirms by sending out scouts with cellular phones. It waits for the ideal wind, detonates the devices, shuts down the world's largest exporting oil field, and causes the near collapse of Saudi Arabia.

- A terrorist group waits for the proper wind pattern and allows the wind to carry a biological agent over an airfield or military facility. Massive casualties occur, and there is no way to predict the next attack.

- A freighter carrying fertilizer enters a port and docks. In fact, the freighter has mixed the fertilizer with a catalyst to create a massive explosion and also carries a large amount of a chemical, radiological, and/or biological agent. The resulting explosion destroys both the immediate target area and scatters the chemical or biological weapon over the area.
- A large terrorist device goes off in a populated, critical economic, or military assembly area—scattering mustard or nerve gas. Emergency teams rush in to deal with the chemical threat, and the residents are evacuated. Only later does it become clear that the device also included a biological agent, that the response to this "cocktail" killed most emergency response personnel, and the evacuation rushed the biological agent to a much wider area.

APPENDIX F

COUNTERPROLIFERATION POLICY OPTIONS

- Dissuasion to convince nonweapons of mass destruction states that their security interests are best served through not acquiring weapons of mass destruction.
- Denial to curtail access to technology and materials for weapons of mass destruction through export controls and other tools.
- Arms control efforts to reinforce the Nuclear Non-Proliferation Treaty, Biological and Chemical Weapons Conventions, nuclear free zones, conventional arms treaties that stabilize arms races, confidence and security building measures, and Anti-Ballistic Missile Treaty clarification efforts to allow U.S. deployment of advanced theater ballistic missile defenses.
- Region-wide arms control agreements backed by intelligence sharing and ruthless, intrusive challenge inspections without regard for the niceties of sovereignty.
- International pressure to punish violators with trade sanctions to publicize and expose companies and countries that assist proliferators, and to share intelligence to heighten awareness of the proliferation problem.
- Defusing potentially dangerous situations by undertaking actions to reduce the threat from weapons of mass destruction already in the hands of selected countries—such as agreements to destroy, inspect, convert, monitor, or even reverse their capabilities.
- Military capabilities to be prepared to seize, disable, or destroy weapons of mass destruction in time of conflict.
- Improve tracking and detection of sales, technology transfer, research efforts, extremist groups.
- Defensive capabilities, both active (theater missile defenses) and passive (protective gear and vaccines) that will mitigate or neutralize the effects of weapons of mass destruction and enable U.S. forces to fight effectively even on a contaminated battlefield.

- Declared and convincing counterstrike options ranging from conventional strikes devastating a user nation's economy, political structure and military forces to the use of nuclear weapons against the population centers of user nations and groups.

APPENDIX G

POSSIBLE FORCE IMPROVEMENTS AFFECTING COUNTERPROLIFERATION POLICY

- *Detection and characterization of biological and chemical agents*. This initiative is intended to accelerate the fielding of stand-off and point detection and characterization systems by up to 6 years. It also addresses the integration of sensors into existing and planned carrier platforms, emphasizing man-portability and compatibility with UAVs.
- *Detection, characterization, and defeat of hard, underground targets.* The United States is seeking new sensors, enhanced lethality, and penetrating weapons to increase the probability of defeating the target while minimizing the risk of collateral damage.
- *Detection, localization and neutralization of weapons of mass destruction inside and outside the United States*. The United States is seeking to identify and evaluate systems, force structures, and operational plans to protect key military facilities and logistic nodes, and conduct joint exercises to improve the capability to respond to potential biological and chemical threats.
- *Development and deployment of additional passive defense capabilities for U.S. forces, including development and production of biological agent vaccines*. This program will develop and field improved protective suits, shelters, filter systems, and equipment 2-5 years faster than previously planned. It also restores funding to the development of improved decontamination methods.
- *Support for weapons of mass destruction related armed control measures include strengthening the NNPT, CTB, and BWC*. They include establishing a COCOM successor regime, and improving controls on exports and technology by strengthening the MTCR, Nuclear Suppliers Group, and Australia Group.
- *Missile defense capabilities, with primary emphasis on theater ballistic missile defenses.* This activity involves improvements in active and passive defenses, attack operations, and

improvements in BM/C4I as well as the deployment of theater missile defenses. The primary focus, however, is on anti-ballistic missile defenses, and in the near term, this involves the development of the Patriot Advanced Capability Level-3 (PAC-3/ERINT), Navy area theater missile defense (Aegis), and theater high altitude area defense (THAAD).

- *Publicized counterstrike options.* Options ranging from a convincing declared capability to conduct precision mass air and missile strikes with conventional weapons that can devastate user states to use of nuclear weapons escalating to the destruction of population centers.
- *New force tailored to dealing with terrorist and unconventional threats.* New intelligence and tracking systems dedicated to the prevention of mass terrorism, and tailored special forces to detect and attack terrorist groups and deal with unconventional uses of weapons of mass destruction.

CHAPTER 8

ENERGY DEPENDENCE

There is another potential transnational threat that the West must consider. The Middle East dominates world energy exports. It has more than 65 percent of the world's proven oil reserves and 36 percent of its gas reserves. According to estimates by the U.S. Department of Energy (DOE), it exported an average of 17.7 million barrels of oil a day (MMBD) in 1995. This was 47 percent of the world total of 37.7 MMBD. The DOE projects that Middle Eastern oil exports will reach 44.4 MMBD by 2020. This will be 63 percent of the estimated world total of 70.9 MMBD.[1] Similar estimates are not available for gas exports, but Algeria, Libya, Iran, Qatar, Oman, and the UAE will play an important role as world suppliers.

The critical geopolitical issue affecting the West is whether the Middle East will be a stable supplier of oil and gas exports at market driven prices. This is not easy to predict in a region that has many intraregional and internal conflicts, serious economic problems, and major demographic problems. The Middle East is so heavily dependent on the income from energy exports that few nations will voluntarily limit their export revenues. War has had a major impact on energy exports in the past, however, and sanctions affect key exporters like Iran, Iraq, and Libya. New questions are also beginning to arise as to whether the Middle East can finance the energy development it needs without more privatization and much higher rates of foreign investment.

The Middle East has to undergo fundamental changes if it is to be a stable source of energy exports. Most of its leaders are aging, and the highly personal patriarchal systems of government they have established are unlikely to survive them. The region must either further reduce its

population growth rate or breed itself into poverty. Similarly, states must either improve the management of their economies, diversify, and shift to far greater reliance on free markets, or risk economic collapse.

A stable future depends on key political events like the success of the Arab-Israeli peace process, the moderation of the Iranian revolution, the creation of a stable and peaceful Iraq, and an end to the civil war in Algeria. It depends on the succession of stable and more progressive regimes in key states like Bahrain, Egypt, Jordan, Libya, Kuwait, Morocco, Oman, Saudi Arabia, and the UAE. It also depends, however, on the willingness of the region to implement sustained economic reform, and to come to grips with the need to reduce population growth, and reduce dependence on foreign labor.

One alternative is that the region will "muddle through," largely preserving the status quo. Political change will be limited and economic growth will barely keep up with population growth, if at all. Internal tensions will grow worse, civil conflict will continue, and some low-level fighting will take place between states.

The high-risk scenario involves a mix of different risks which can be combined in very unpredictable ways. These risks include a succession crisis or internal instability in Saudi Arabia, instability in Iran and a transfer of power to revolutionary extremists, and continued revanchism and authoritarianism in Iraq. They include the collapse of the Arab-Israeli peace process and continuing civil conflict in Algeria and Libya.

In the end, it is the Gulf which will be critical to determining whether the Middle East will pose a transnational threat in terms of energy. While many studies talk about the oil wealth of the Middle East, virtually all of this energy wealth is concentrated in the Gulf. The Middle East as a whole may have more than 65 percent of the world's proven oil reserves and 40 percent of its gas reserves, but over 90 percent of these oil reserves are

in the Gulf. Similarly, estimates of the DOE indicate that the Gulf averaged 15.4 MMBD worth of exports in 1995, and will reach 41.8 MMBD by 2020. This equaled 41 percent of all world exports in 1995, versus 47 percent for the entire Middle East. The Gulf is projected to produce 59 percent of all world exports by 2020, versus 63 percent for the entire Middle East.[2]

The Gulf also has major gas reserves and is becoming a major exporter of liquid natural gas. While the Russian Federation dominates the world's reserves with 1,700 trillion cubic feet, or 33.4 percent of the world total, Iran alone has 16 percent of the word's gas reserves, and Qatar and the UAE have another 10 percent. In total, the Gulf has over 33 percent of the world's reserves. The rest of the Middle East adds less than another 3 percent.[3]

It seems unlikely that the West needs to plan for another oil embargo, and Western power projection capabilities and security arrangements with the Gulf seem capable of ensuring that no major, sustained interruption will take place in exports. The oil sharing arrangements run by the International Energy Agency should be adequate to deal with most low level emergencies. At the same time, other threats remain:

- Conventional wars in the region can affect energy exports, as did the Iran-Iraq War.

- The acquisition of weapons of mass destruction creates massive new threats to energy production and export facilities.

- Internal civil conflicts can lead to the destruction of key facilities, or to the inability to develop key and expanded energy production at the rates required to keep prices low or moderate.

- Extremist governments may limit or halt production, regardless of the economic pressures to maximize oil revenues.

- Internal political developments may lead nations to demand that Western forces withdraw, and create a power vacuum in the Gulf.

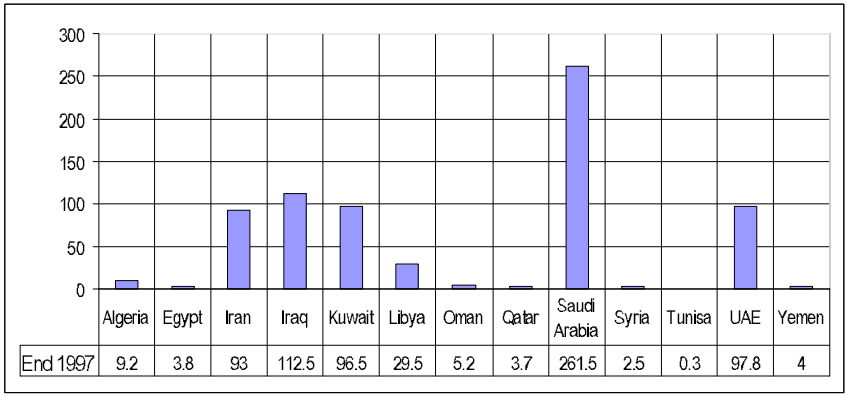
These threats do not seem imminent, but Tables 8 through 10 illustrate just how the West and the global economy depend on the Middle East and on a handful of key nations in the region.

CHAPTER 8 - ENDNOTES

1. Energy Information Agency, *International Energy Outlook, 1998,* Washington, DOE/EIA-0484(98), April 1998, p. 36.

2. *Ibid.*

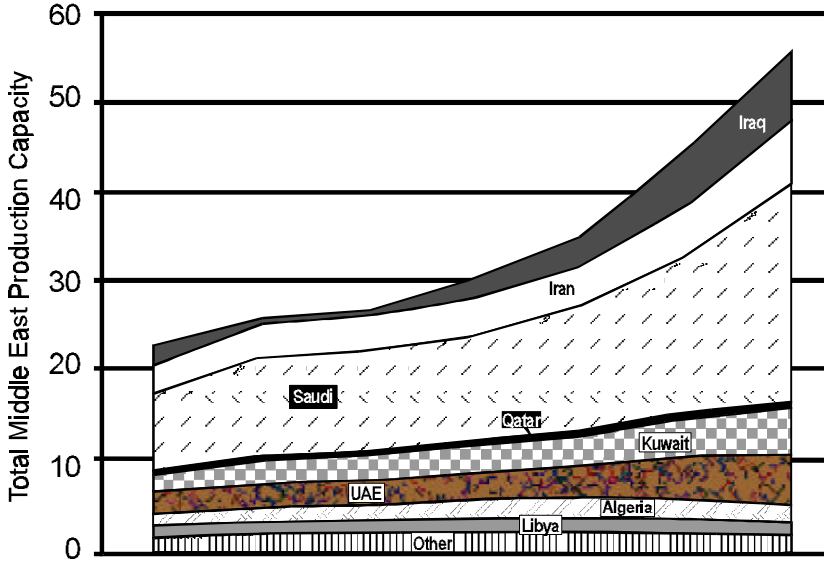
3. *Ibid.*, p. 51.



Country	End-1996	End-1997	Percent of World Proven Reserves	Reserve to Production Ratio In Years at Current Rates
Algeria	9.2	9.2	0.9	18.8
Egypt	3.7	3.8	0.4	11.4
Iran	93.0	93.0	9.0	69.0
Iraq	112.0	112.5	10.8	100+
Kuwait	96.5	96.5	9.3	100+
Libya	29.5	29.5	2.8	55.6
Oman	5.1	5.2	0.5	15.8
Qatar	3.7	3.7	0.4	15.1
Saudi Arabia	261.5	261.5	25.2	79.5
Syria	2.5	2.5	0.2	12.0
Tunisia	0.3	0.3	-0.5	-0.5
UAE	97.8	97.8	9.4	100+
Yemen	4.0	4.0	0.4	28.9
TOTAL	**718.8**	**719.5**	**69.8**	**28.9**

Source: *BP Statistical Review of World Energy*, 1997 and *Middle East Economic Digest*, July 24, 1998, p. 12.

Table 8. Proven Middle East Oil Reserves by Country (in Billions of Barrels).



	1990	1996	2000	2005	2010	2015	2020
Iraq	2.2	0.6	0.6	2.1	3.2	5.9	7.8
Iran	3.2	3.9	4.0	4.3	4.5	5.7	6.8
Saudi	8.6	10.6	10.9	11.2	13.5	17.2	23.8
Qatar	0.5	0.6	0.5	0.6	0.6	0.6	0.7
Kuwait	1.7	2.6	2.8	3.1	3.3	4.3	5.2
UAE	2.5	2.6	2.8	3.1	3.5	4.7	5.5
Algeria	1.3	1.4	1.6	1.9	2.2	2.1	2.0
Libya	1.5	1.5	1.5	1.6	1.7	1.6	1.5
Other	1.4	2.0	2.0	2.3	2.2	2.1	1.9
Total Gulf	18.7	20.9	21.6	24.4	28.6	38.4	49.8
Total Middle East	22.9	25.8	26.7	30.2	34.7	44.2	55.2
Total World	69.5	74.4	79.5	88.3	97.3	107.4	118.7

Source: Adapted by Anthony H. Cordesman from EIA, *International Energy Outlook, 1998*. DOE/EIA-0484 (98), April 1998, pp. 175-177, and EIA, *Monthly Energy Review*, April 1997, pp. 130-131.

Table 9. Estimated Middle East Oil Production Capacity (EIA Reference Gas in MMBD).

Exporting Region	Industrialized			Importing Region		Nonindustrialized			
	North America	Western Europe	Asia	Total Industrial World	Pacific Rim	China	Rest of Non-industrial World	Total Non-industrial World	Total World
Use of Exports in MMBD									
1995									
Persian Gulf	1.8	3.4	4.2	**9.4**	4.1	0.4	1.5	**6.0**	**15.4**
North Africa	0.3	1.9	0.0	**2.2**	0.0	0.0	0.1	**0.1**	**2.3**
Total	**2.1**	**5.3**	**4.2**	**11.6**	**4.1**	**0.4**	**1.6**	**6.1**	**17.7**
2020									
Persian Gulf	3.1	3.8	6.9	**13.8**	10.1	6.9	11.0	**28.0**	**41.8**
North Africa	0.3	1.9	0.2	**2.4**	0.1	0.0	0.2	**0.3**	**2.7**
Total	**4.2**	**8.0**	**6.6**	**18.7**	**11.6**	5.1	**5.1**	**21.7**	**44.5**
Percentage of Total Exports Going to a Given Region									
1995									
Persian Gulf	11.7	22.1	27.3	**61.1**	26.6	2.6	9.7	**38.9**	**100.0**
North Africa	13.0	82.6	0.0	**95.6**	0.0	0.0	4.4	**4.4**	**100.0**
2020									
Persian Gulf	7.4	9.1	16.5	**33.0**	24.2	16.5	26.3	**67.0**	**100.0**
North Africa	11.1	70.3	7.4	**88.8**	3.7	0.0	7.5	**11.2**	**100.0**

Source: Adapted by Anthony H. Cordesman from estimates in *International Energy Outlook, 1998*, Washington, DOE/EIA, April 1998, pp. 36.

Table 10. Estimated Trends in Middle Eastern Petroleum Exports by Supplier and Destination (Millions of Barrels Per Day).

CHAPTER 9

CONCLUSIONS

The most difficult problem in any risk analysis of transnational threats from the Middle East remains one of perspective. There are many possibilities but there is no way to assign probabilities—there simply is no valid way to distinguish between "crying wolf" and "crying havoc." Drugs and immigration problems do challenge both the Middle East and the West. Middle Eastern terrorism is very real and so is proliferation. If these two threats should be combined into superterrorism, the result would create a new form of asymmetric warfare for which the West is singularly ill-prepared.

The previous analysis does not indicate that any of these threats as yet require draconian action, and narcotics and immigration seem to be realities that both the West and Middle East will have to learn to live with. The analysis does indicate, however, that the scale of terrorist attacks may be rising, and that there are few prospects that terrorist attacks will end. The West will almost certainly have to deal with new bombings and large-scale attacks, it will remain the target of extremist groups, and some of the struggle between repressive regimes and violent opposition groups will continue. It is not yet clear that such groups will use weapons of mass destruction, but it is a possibility whose consequences are so serious that it deserves serious consideration.

Current Western power projection capabilities can deal with the kind of conventional threats that Middle Eastern states can pose to one another or Western interests. U.S. power projection forces, supported by Britain and possibly France, should be adequate to deal with even major regional powers like Iran and Iraq. The key problem is what will happen as Middle Eastern states acquire more weapons of

mass destruction and some of them acquire long-range missiles that can strike Europe or possibly the United States.

The threat of state-sponsored terrorism using weapons of mass destruction is becoming so serious that it at least requires Western contingency planning. It is clear that the West should take every possible step to reinforce its counterterrorism capabilities to deal with conventional terrorist threats, and every possible step to block or delay proliferation. It seems premature to call for the immediate deployment of extremely high cost measures like missile defenses or the kind of counterproliferation program that could provide meaningful defenses and recovery capability against superterrorism. But, it seems foolish not to consider the development of plans for missile defenses and to deal with superterrorism, and to develop the technology, weapons systems, and organizational plans and concepts to be able to react in the future.

Energy exports are another critical issue. While market forces can probably ensure adequate energy exports in the absence of major conflicts, there are risks. These risks are compounded by a slow probable decline in the margin of surplus production capacity, and uncertainties as to whether the region can fund all of the energy investment required as long as it creates so many barriers to outside investment and efficient internal investment.

ABOUT THE AUTHOR

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