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RESPONDING TO TERRORISM ACROSS THE TECHNOLOGICAL SPECTRUM

Bruce Hoffman

July 15, 1994

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## FOREWORD

In April 1994, the Army War College's Strategic Studies Institute held its annual Strategy Conference. This year's theme was "The Revolution in Military Affairs: Defining an Army for the 21st Century." Dr. Bruce Hoffman presented this paper as part of a panel examining "New Technologies and New Threats."

Terrorism, of course, is not new. Hoffman warns, however, of the changing nature of terrorism. In the past, terrorists have been motivated by limited political and ideological objectives. Popular images fostered by terrorist events like the bombing of PAN AM Flight 103 and the attack on the Marine Barracks in Beirut notwithstanding, in the past the preponderance of terrorist attacks targeted specific individuals or small groups. The weapons of choice were the pistol, knife, and, on occasion, dynamite. Often the terrorist was a highly-trained individual, a "professional" in pursuit of specific political or ideological objectives.

Hoffman warns that, by comparison, the terrorists of today and tomorrow are amateurs. Furthermore, they are likely to act from religious and racial convictions rather than radical political or ideological motivations. Their objective may be to kill large numbers of people. Indeed, they may want to annihilate an entire race or religious group. Not only are these amateurs less predictable and, therefore, more difficult to apprehend before the incident occurs, they have at their disposal lethal devices that range from the relatively simple fertilizer bomb to biologically-altered viruses.

Military professionals and civilian planners must contend with warfare at every level. The threat posed by the changing nature of terrorism falls very much within their purview. For that reason, I commend to you the following monograph.

JOHN W. MOUNTCASTLE  
Colonel, U.S. Army  
Director, Strategic Studies Institute

#### BIOGRAPHICAL SKETCH OF THE AUTHOR

BRUCE HOFFMAN is Director of the Strategy and Doctrine Program in RAND's Army Research Division and a member of the senior research staff in RAND's International Policy Department. He is also associate editor of *Studies in Conflict and Terrorism*, an academic journal published in the United States and England. A graduate of Oxford University (where he undertook his doctoral research), Dr. Hoffman holds degrees in government, history, and international relations. In August 1994 he will take the appointment as Senior Lecturer in International Relations at the University of St. Andrews in Scotland.

## RESPONDING TO TERRORISM ACROSS THE TECHNOLOGICAL SPECTRUM

The "revolution in military affairs," it is argued, heralds a new era of warfare dominated by the American military's mastery of the conventional battlefield. "Just as gunpowder, the mechanization of battle, and atomic weapons previously changed the fundamental conduct and nature of warfare, so will a combination of technological progress, doctrinal sophistication, and innovative force employment in turn render . . . existing methods of conducting warfare obsolete." The assumption that U.S. armed forces alone will have the capability to harness all the elements of this revolution is in large measure derived from the demonstrated superiority of American combined arms over the much larger Iraqi forces during the 1991 Persian Gulf War.<sup>1</sup> The effect, according to one analysis, will be profound:

In any conventional conflict in which the United States or any of the major Western powers is pitted against a Third World adversary, the outcome is preordained. In effect, the change is so significant that we have returned to the military equation of the 19th century, when colonial wars pitted small numbers of disciplined, well-trained Western troops with rifles against hordes of tribal warriors armed only with shields and spears.<sup>2</sup>

Equally significant, however, is that the revolution in military affairs remains largely confined to the conventional battlefield only. Indeed, as many observers of this phenomenon themselves concede, the revolution will have little, if any, impact on American military capabilities so far as countering terrorism, insurgency, or guerrilla warfare.<sup>3</sup> Hence, while Operation DESERT STORM may be a model for the revolution in military affairs occurring at the mid and high ends of the conflict spectrum, the problems that U.S. forces encountered in Somalia, for example, may be a more accurate and telling model for the types of conflict at the low end of the spectrum that U.S. military forces are more likely to find themselves involved. As our frustrating and increasingly forgotten experiences in Vietnam more than a quarter of a century ago demonstrate, this is by no means a new lesson. Indeed, in no realm of conflict today is the asymmetry between American capability and sophistication on the one hand and the crude, even primitive, ability of an adversary to inflict pain on the other perhaps as salient or possibly portentous as with terrorism.

### **Trends in Terrorist Tactics.**

The contrast between the means and methods of modern warfare and the tactics and techniques of contemporary terrorism is striking. Whereas technological progress has produced successively more complex, lethally effective and destructively accurate weapons systems that are deployed from a variety of air, land, and sea platforms, terrorism has functioned largely in a technological vacuum, aloof or averse to the continual refinement and growing sophistication of modern warfare.

Terrorists continue to rely, as they have for more than a century, on the same two basic "weapons systems": the gun and the bomb. Admittedly, the guns used by terrorists today have larger ammunition capacities and more rapid rates of fire than the simple revolver the Russian revolutionary Vera Zasulich used in 1878 to assassinate the governor general of St. Petersburg.<sup>4</sup> Similarly, bombs today require

smaller amounts of explosives that are exponentially more powerful and more easily concealed than the sticks of TNT with which the Fenian dynamiters terrorized London more than a century ago.<sup>5</sup>

The implication of terrorist reliance on these two weapons, however, goes far beyond mere tactical convenience. It also suggests an a priori reluctance or aversion to killing en masse given the comparatively discrete numbers of casualties that can be inflicted with even self-loading, rapid fire automatic weapons or powerful plastic explosives. Despite its popularity as a fictional theme, terrorists in fact have rarely contemplated--much less actively attempted--the infliction of mass, indiscriminate casualties through the use of chemical, biological, or nuclear weapons. Indeed, of more than 8,000 incidents recorded in *The RAND Chronology of International Terrorism* since 1968, only 52 evidence any indication of terrorists plotting such attacks, attempting to use chemical or biological agents or to steal, or otherwise fabricate on their own nuclear devices.<sup>6</sup> Thus, terrorists seem almost inherently content with the limited killing potential of their handguns and machine guns and the slightly higher rates that their bombs have at times achieved.

This self-imposed restraint is most clearly reflected in the risk-averse tactical repertoire embraced by most terrorist groups. Bombings, for example, account for nearly half (46 percent) of all international terrorist attacks carried out since 1968: a proportion that annually has rarely fallen below 40 percent or exceeded 50 percent.<sup>7</sup> The reliance on bombing by terrorists is not surprising given that bombs provide a dramatic, yet fairly easy and often risk-free means of drawing attention to the terrorists and their causes. Few skills are required to manufacture a crude bomb, surreptitiously plant it, and then be miles away when it explodes. Bombings are usually only one or two or three person jobs and therefore do not require the same organizational expertise, logistics, and knowledge required of more complicated or sophisticated operations, such as kidnapping, barricade and hostage situations, assassination, and assaults against defended targets.

Attacks on installations (including attacks with automatic weapons as well as hand grenades, bazookas, and rocket-propelled grenades, drive-by shootings, arson, vandalism, and sabotage other than bombing) are a distant second to bombing, accounting for 22 percent of all terrorist operations since 1968.<sup>8</sup> Not surprisingly, perhaps, the frequency of various types of terrorist attacks tends to decrease in direct proportion to the complexity or sophistication required. Accordingly, hijackings are the third most common tactic, accounting for only 12 percent;<sup>9</sup> followed by assassination (6 percent);<sup>10</sup> and, kidnapping (1 percent).<sup>11</sup>

The fact that these percentages have remained largely unchanged for more than a quarter of a century (with one exception<sup>12</sup>) also provides compelling evidence that the vast majority of terrorist organizations are not tactically innovative. Radical in their politics, these groups are equally conservative in their operations, rarely deviating from the familiar and adhering to an established modus operandi that, to their minds at least, minimizes failure and maximizes success. What innovation does occur is mostly in the methods used to conceal and detonate explosive devices, not in their tactics or in their use of nonconventional weapons (i.e., chemical, biological, or nuclear).

Terrorists, therefore, seem to prefer the assurance of modest success to more complicated and complex--but potentially higher pay-off (in terms of casualties and publicity)--operations. Indeed, this explanation possibly accounts for the overall paucity of terrorist "spectaculars" and the mostly limited number of casualties historically inflicted in terrorist attacks (i.e., more often in the tens and twenties, if at all, than in the low hundreds). Indeed, since the beginning of the century fewer than a dozen terrorist incidents have occurred that have resulted in the deaths of more than a 100 persons at one time.<sup>13</sup> The recent spate of suicide bombings in Israel by Palestinians opposed to negotiations to resolve that long-standing conflict underscores this point. Even when a terrorist deliberately sacrifices himself in the course of the attack, seldom does the death toll reach double figures: only seven persons, for example, tragically lost their lives in the incident on April 6; five perished in the following week's attack. The massive car bomb that exploded on Sunday, April 24, 1994, in Johannesburg, South Africa, is another case in point: despite the bombers' obvious intention to inflict mass indiscriminate casualties, only nine persons were killed.

These proclivities, therefore, directly affect, if not limit, the weapons technology that terrorists can and will use. Accordingly, based on the historical record, future terrorist employment of either high-tech weapons systems or weapons of mass destruction (i.e., chemical, biological or nuclear) would appear unlikely. However, both the longevity of this trend and the self-imposed stasis of terrorist technology could change dramatically as a result of three emerging trends in terrorist activity:

- The resurgence of terrorism motivated by a religious imperative and the implications that it has to trigger future acts of mass, indiscriminate violence;

- The increasing "amateurization" of terrorism--a reflection, in part, of the growth of religious terrorism but which also may contribute to the loosening of previous self-imposed constraints on operations and lethality; and,

- The increasing sophistication and evident growing tactical and technological competence of certain veteran terrorist organizations across the technological spectrum.

### **The Resurgence of Religious Terrorism.**

One of the distinguishing features of international terrorism during the past 15 years has been the resurgence and proliferation of terrorist groups motivated by a religious imperative.<sup>14</sup> In 1968, for example, none of the 11 identifiable terrorist groups active throughout the world could be classified as religious, that is, having aims and motivations reflecting a salient religious character or influence.<sup>15</sup> Not until 1980, as a result of the repercussions from the revolution in Iran the previous year,<sup>16</sup> do the first "modern"<sup>17</sup> religious terrorist groups appear. Even so, despite the large increase in the total number of identifiable international terrorist groups and concomitant increase of ethnic separatist organizations (from 3 to 32), only 2 of the 64 groups are predominantly religious in character and motivation (al-Dawa and the Committee for Safeguarding the Islamic Revolution). Twelve years later, however, the number of religious terrorist groups has increased nearly



six-fold while--at a time of increasingly strident assertions of ethnic, national, and cultural uniqueness--the number of ethnic-separatist terrorist groups has declined and--notwithstanding the end of the cold war--the number of Marxist-Leninist-Maoist (or some idiosyncratic interpretation of those dicta) has remained unchanged.

The implications of terrorism motivated by a religious imperative for higher levels of lethality is evidenced by the violent record of various Shi'a Islamic groups. Although these organizations committed only 8 percent of all international terrorist incidents since 1982, they are nonetheless responsible for 28 percent of the total number of deaths.<sup>18</sup> Moreover, contrary to its depiction and discussion in Western news accounts, terrorism motivated by religion is by no means a phenomenon restricted to Islamic terrorist groups exclusively in the Middle East. Many of the characteristics of Shi'a terrorist groups, such as the legitimization of violence based on religious precepts, the sense of profound alienation and isolation, and the attendant preoccupation with the elimination of a broadly defined category of "enemies," are also apparent among militant Christian white supremacists in the United States, in at least some radical Jewish messianic terrorist movements in Israel, and among some radical Sikh movements in India.<sup>19</sup>

The fact that for many of these groups the elimination of whole segments of society is a major objective of their terrorist campaigns implies an almost axiomatic attempt to use weapons of mass destruction, including chemical or biological warfare agents or radioactive materials. During the past decade, for example, religious terrorists or members of various "cults" have come closest to crossing the threshold of terrorist use of bona fide weapons of mass destruction. They have, for example, either attempted or at least pursued the idea of:

- Poisoning the water supplies of major American urban centers;<sup>20</sup>
- Dispersing toxic chemicals through internal building ventilation systems;<sup>21</sup>
- Blowing up a religious shrine in hopes of provoking a cataclysmic "holy war";<sup>22</sup>
- Staging indiscriminate, wanton simultaneous bombings of crowded, busy urban centers;<sup>23</sup> and,
- Contaminating food in public restaurants.<sup>24</sup>

That terrorists motivated by a religious imperative can contemplate such massive acts of death and destruction is a reflection of their belief that violence is a sacramental act or a divine duty. Terrorism thus assumes a transcendental dimension,<sup>25</sup> and its perpetrators are seemingly unconstrained by the political, moral, or practical constraints that affect other terrorists. Whereas secular terrorists generally consider indiscriminate violence immoral and counterproductive,<sup>26</sup> religious terrorists regard such violence as both morally justified and a necessary expedient for the attainment of their goals. Religious and secular terrorists also have different perceptions of themselves and their violent acts. Secular terrorists regard violence as a way of instigating the correction of a flaw in a system that is basically good or to foment the creation of a new system. Religious terrorists, on the other hand, regard themselves not as components of a

system, but as "outsiders" seeking vast changes in the existing order.<sup>27</sup> This sense of alienation enables the religious terrorist to contemplate far more destructive and deadly types of terrorist operations than secular terrorists and indeed to embrace a far more open-ended category of "enemies" for attack: basically anyone who is not a member of their particular sect or religious movement.

Given this constellation of characteristics and convergence of motives and capabilities, religious terrorists therefore appear as the most likely terrorist entity to eventually succeed in affecting some dramatic act of violence using a weapon of mass destruction.

#### **The "Amateurization" of Terrorism.**

A series of terrorist incidents that occurred in the United States during 1993 suggest that we may have to revise our notions of the stereotypical terrorist organization.<sup>28</sup>

In the past, terrorist groups were recognizable as a group of individuals belonging to an organization with a well-defined command and control apparatus, who had been previously trained (however rudimentarily) in the techniques and tactics of terrorism, were engaged in conspiracy as a full-time avocation, living underground and constantly planning or plotting terrorist attacks at times under the direct control, or operating at the express behest, of a foreign government. The amateurish World Trade Center bombers, however, may be the model of a new kind of terrorist group: a more or less ad hoc amalgamation of like-minded individuals sharing a common religion, the same friends and frustrations, perhaps having family ties as well, who simply gravitate toward one another for specific, perhaps even one-time, operations.<sup>29</sup> Rather than being tightly controlled from abroad, these new part-time terrorists and independent free-lance groups are more likely to be only indirectly connected to a central command authority or a foreign government.

Moreover, since this more amorphous and perhaps even transitory type of group will lack the "footprints" or modus operandi of an actual, existing terrorist organization, it is likely to prove more difficult for law enforcement to get a firm idea or build a complete picture of the dimensions of their intentions and capabilities.<sup>30</sup> Indeed, as one New York City police officer only too presciently observed two months before the Trade Center attack: it wasn't the established terrorist groups--with known or suspected members and patterns--that worried him, but the hitherto unknown "splinter groups," composed of new or marginal members from an older group, that suddenly surface out of nowhere to attack.<sup>31</sup>

Essentially part-time time terrorists, such loose groups of individuals may be--as the World Trade Center bombers themselves appear to have been--*indirectly* influenced or remotely controlled by some foreign government or nongovernmental entity. The suspicious transfer of funds from banks in Iran and Germany to a joint account maintained by the accused bombers in New Jersey just before the Trade Center blast may illustrate this more indirect or circuitous foreign connection.<sup>32</sup> Moreover, the fact that two Iraqi nationals--Ramzi Ahmed Yousef and Abdul Rahman Yasin--implicated in the Trade Center conspiracy, fled the United States (presumably to Iraq),<sup>33</sup> in one instance just before the bombing and in the other shortly after the first arrests, increases

suspicion that the incident may not only have been orchestrated from abroad but may in fact have been an act of state-sponsored terrorism.<sup>34</sup> Thus, in contrast to its depiction in the press as an incident of terrorism perpetrated by a group of "amateurs" acting either entirely on their own or, as one of the bomber's defense attorneys portrayed his client as being manipulated by a "devious, evil . . . genius"<sup>35</sup> (Yousef), the genesis of the Trade Center attack may be far more complex.

This use of amateur terrorists as "dupes" or "cut-outs" to mask the involvement of some foreign patron or government could therefore greatly benefit terrorist state sponsors who could more effectively conceal their involvement and thus avoid potential military retaliation by the victim country and diplomatic or economic sanctions from the international community. Moreover, the prospective state sponsor's connection could be further obscured by the fact that much of the "amateur" terrorists equipment, resources and even some funding could be self-generating. The explosive device used in the World Trade Center bomb--constructed out of ordinary, commercially-available materials, including lawn fertilizer (urea nitrate) and diesel fuel and costing less than \$400 to construct--illustrates this potential.<sup>36</sup> Indeed, despite the Trade Center bombers' almost comical ineptitude in avoiding capture, they were still able to shake an entire city's--if not country's-- complacency. Moreover, the single bomb used by these "amateurs" proved just as deadly and destructive as the more "high-tech" bombs constructed out of military ordnance, with timing devices powered by computer micro chips and detonated by sophisticated timing mechanisms used by their "professional" counterparts. It killed six persons, injured more than a 1,000 others, gouged out a 180-ft wide crater six stories deep, and caused an estimated \$550 million in both damages to the twin towers and in lost revenue to the businesses housed there.<sup>37</sup>

In this respect, this new breed of terrorists may represent even more of a threat than their predecessors.<sup>38</sup> While less control from some central command authority may indeed be exerted, this may also result in fewer constraints on the terrorists' operations and targets and fewer inhibitions on their desire to inflict indiscriminate casualties.<sup>39</sup> It is suspected that the bombers' intent in attacking the World Trade Center was to bring down one of the twin towers.<sup>40</sup> Significant also is that rather than having been deterred or otherwise affected by the rapidity with which the FBI and other authorities "cracked" the Trade Center case, the 15 individuals implicated in the follow-on plot, uncovered in June 1993, to obtain the release of the Trade Center bombers, had plotted even more egregious acts of violence. These included the simultaneous bombing of the Holland and Lincoln tunnels and George Washington Bridge used daily by thousands of commuters between New Jersey and Manhattan; a car-bomb attack in the United Nations building underground garage; a forced entry machine-gun and hand grenade assault on the Federal Building in lower Manhattan housing the FBI New York headquarters; and the assassinations of U.N. Secretary General Boutros Boutros Ghali, Egyptian President Hosni Mubarak, New York Senator Alfonse D'Amato, and Brooklyn assemblyman Dov Hilkind.<sup>41</sup>

The characteristics and attendant applications of this "amateurization" of terrorism was further demonstrated by the rash of independent, unconnected acts of "teenage" terrorism that occurred in California and Washington State last summer. The first incident involved the 20-year-old leader of a self-styled terrorist group calling itself the "Fourth Reich Skinheads" and his 17-year-old co-conspirator, who

were arrested in Los Angeles and charged with planning a series of bombings against a variety of Jewish targets that would culminate in a machine-gun and hand grenade assault against a South Central Los Angeles church as its worshippers emerged from Sunday services.<sup>42</sup> The operation had to be postponed, however, after one of the conspirators was refused permission by his parents to borrow the family car for the attack.<sup>43</sup>

That same month, in an unrelated incident, a 19-year-old was arrested and charged with bombing a Tacoma, Washington, National Association for the Advancement of Colored People (NAACP) meeting hall as the opening salvo in a terrorist campaign directed against rap stars, synagogues and military installations throughout the Pacific Northwest.<sup>44</sup> Finally, in November, the putative leader of another teen-age white supremacist group, the "Aryan Liberation Front," was arrested in Northern California and charged with five fire bombings of a synagogue, local office of the NAACP, the home of an Asian-American local politician, and the state office that handles discrimination claims in Sacramento.<sup>45</sup> The youth-- who turned 18 the day after his arrest--had called a television station after one attack to announce that, "The A.L.F. takes full responsibility for the attack and promises to contribute to armed struggles whether it be by rocks, Molotov cocktails, bombs, guns, to effect the change in Jew capitalism and America politically."<sup>46</sup>

In the past, terrorism was not just a matter of having the will and motivation to act, but of having the capability to do so, the requisite training, access to weaponry, and operational knowledge. Today, however, it is clear that the means and methods of terrorism are readily available and accessible to anyone with a grievance, agenda or purpose or any idiosyncratic combination of the above. Whether abetted tacitly or actively by a foreign patron or facilitated by commercially obtainable published bomb-making manuals and operational guidebooks, the "amateur" terrorist can be just as--and perhaps even more--deadly and destructive than his more "professional" counterpart. Given the inherent difficulty in tracking and anticipating this category of adversary--as opposed to the often more established modus operandi and patterns of existing terrorist groups--this new breed of terrorist may pose a greater threat in the future.<sup>47</sup>

### **Improved "Professionalism" of Terrorists.**

Paradoxically, while on the one hand terrorism frequently attracts "amateurs," on the other, the sophistication and operational competence of "professional" terrorists is also increasing. The professionals are becoming demonstrably more adept in their trade craft of death and destruction; more formidable in terms of their abilities of tactical modification, adjustment and innovation; and able to operate for sustained periods of time while avoiding detection, interception and arrest or capture. More disquieting, these "professional" terrorists seem to be considerably more ruthless as well.

An almost Darwinian principle of natural selection appears to distinguish subsequent generations of existing terrorist groups, whereby every new terrorist generation learns from its predecessors, becoming smarter, tougher, and more difficult to capture or eliminate.<sup>48</sup> For terrorists, intelligence is not only an essential prerequisite for a successful operation, but a sine qua non for survival. Successor generations, therefore, routinely study the "lessons" from mistakes made

by former comrades who have been either killed or apprehended. Press accounts, judicial indictments, courtroom testimony, and trial transcripts are meticulously culled for information on security force tactics and methods and are absorbed by surviving group members.

According to one German government official, terrorists belonging to the Red Army Faction (RAF), for example, "closely study every court case against them to discover their weak spots." Whereas, in the past, German police could usually obtain fingerprints from the bottom of toilet seats or the inside of refrigerators, RAF terrorists today apply a special ointment to their fingers that, after drying, prevents fingerprints and thus thwarts identification and incrimination.<sup>49</sup> As a spokesperson for the *Bundeskriminalamt* lamented, "The 'Third Generation' learnt a lot from the mistakes of its predecessors and about how the police works . . . they now know how to operate very carefully."<sup>50</sup> Indeed, according to a former member of the organization, Peter Juergen Brock, currently serving the seventh year of a life sentence for murder, the group "has reached maximum efficiency."<sup>51</sup>

Similar accolades have also been bestowed on the latest generation of Provisional Irish Republican Army (PIRA) fighters. The former General Officer Commanding British Forces in Northern Ireland, General Sir John Wilsey, has described the PIRA as "an absolutely formidable enemy. The essential attributes of their leaders are better than ever before. Some of their operations are brilliant in terrorist terms."<sup>52</sup> Even the PIRA's comparatively unsophisticated Loyalist terrorist counterparts are on such a "learning curve as well." As one Royal Ulster Constabulary police officer has noted, the Protestant groups "[m]ore and more . . . are running their operations from small cells, on a need to know basis. They have cracked down on loose talk. They have learned how to destroy forensic evidence. And if you bring them in for questioning, they say nothing."<sup>53</sup>

Not only are successor generations often smarter than their predecessors, but they also tend to be both more sophisticated and ruthless as well as less idealistic. For some, in fact, violence becomes almost an end in itself--cathartic release, a self-satisfying blow struck against the hated "system"--rather than being regarded as the deliberate means to a specific political end embraced by previous generations.<sup>54</sup> A dedicated "hard core" of some 20 to 30 terrorists today, for example, compose a third generation of Germany's RAF. In contrast to the group's first generation, who more than 20 years ago embarked on an anti-establishment campaign of nonlethal bombings and arson attacks, the present generation has pursued a strategy of cold-blooded assassination.<sup>55</sup>

During the past 7 years the RAF has murdered six prominent, heavily guarded, Germans. Indeed, the group's almost relentless targeting of well-protected individuals sets it apart from the vast majority of terrorist organizations who typically aim for the "softer" (i.e., easily accessed) rather than "harder" target.<sup>56</sup> The RAF's last victim was Detlev Rohwedder, a wealthy industrialist and chairman of the *Treuhandanstalt*, or Public Trustee, the government agency charged with overseeing the economic transition of eastern Germany. Rohwedder was killed in April 1991 while he sat in his study with a shot fired from a high-powered rifle.<sup>57</sup> In December 1989, financier and Deutsche Bank president Alfred Herrhausen was assassinated when a state-of-the-art remote control bomb concealed in a parked bicycle and triggered by a

light beam was detonated just as Herrhausen's car passed.<sup>58</sup> A similar device was used the following July in an attempt to assassinate Germany's top government counterterrorist official, Hans Neusel.<sup>59</sup> Almost as disturbing as the assassinations themselves is the fact that, until this past summer, the perpetrators--and their fellow conspirators--had eluded what is perhaps the most sophisticated antiterrorist machinery in the world.<sup>60</sup>

The PIRA's relentless quest to pierce the armor protecting both the security forces in Northern Ireland and the most senior government officials in England illustrates the professional evolution and increasing operational sophistication of a terrorist group. The first generation of early 1970s' PIRA devices were often little more than crude antipersonnel bombs, consisting of a handful of roofing nails, wrapped around a lump of plastic explosive and detonated simply by lighting a fuse. Time-bombs from the same era were hardly more sophisticated. They typically were constructed from a few sticks of dynamite and commercial detonators stolen from construction sites or rock quarries and attached to ordinary battery powered alarm clocks. Neither device was very reliable and often put the bomber at considerable risk. The process of placing and actually lighting the first type of device carried with it the inherent potential to attract undesired attention while affording the bomber little time to effect the attack and make good his or her escape. Although the second type of device was designed to mitigate precisely this danger, its timing and detonation mechanism was often so crude that accidental or premature explosions were not infrequent, thus causing some terrorists inadvertently to kill themselves.<sup>61</sup>

In hopes of obviating, or at least reducing, these risks, the PIRA's bombmakers invented a means of detonating bombs from a safe distance using the radio controls for model aircraft purchased at hobby shops. Scientists and engineers working in the British Ministry of Defence's (MoD) scientific research and development (R&D) division in turn developed a system of electronic countermeasures and jamming techniques for the Army that effectively thwarted this means of attack.<sup>62</sup> However, rather than abandon this tactic completely, the PIRA began to search for a solution. In contrast to the state-of-the-art laboratories, huge budgets, and academic credentials of their government counterparts, PIRA's own R&D department toiled in cellars beneath cross-border safe houses and backrooms of urban tenements for 5 years before devising a network of sophisticated electronic switches for their bombs that would ignore or bypass the Army's electronic countermeasures.<sup>63</sup>

Once again, the MoD scientists returned to their laboratories. They emerged with a new system of electronic scanners able to detect radio emissions the moment the radio is switched on, just tens of seconds before the bomber can actually transmit the detonation signal. The almost infinitesimal window of time provided by this "early warning" of impending attack is just sufficient to allow Army technicians to activate a series of additional electronic measures to neutralize the transmission signal and render detonation impossible.

For a time, this countermeasure proved effective as well. But within the past 2 years the PIRA has discovered a means to outwit even this countermeasure. Utilizing radar detectors, such as those employed by motorists in the United States, in 1991 the group's bombmakers

fabricated a detonating system that can be triggered by the same type of hand-held radar gun used by police throughout the world to catch speeding motorists. Since the radar gun can be aimed at its target before being switched on, and the signal that it transmits is nearly instantaneous, no practical means currently exists that allows the time needed either to detect or intercept the transmission signal.<sup>64</sup> More recently, PIRA R&D units have developed yet another means to detonate bombs using a photo flash "slave" unit that can be triggered from a distance of up to 800 meters by a flash of light. The device, which sells for between 60 and 70 English pounds, is used by commercial photographers to produce simultaneous flashes during photo shoots. The PIRA bombers attach the unit to the detonating system on a bomb and then simply activate it with a commercially-available, ordinary flashgun.<sup>65</sup>

As with the new "photo flash" means of detonation, the sophistication of a device is often its very simplicity. In recent years, for example, the PIRA has mounted a highly effective campaign of "economic warfare" using simple incendiary devices left in Belfast and London department stores. These use a plastic cassette tape container, a miniature detonator, a timing device powered by a radio battery, a small amount of plastic explosive or explosive power, two or three capsules of lighter fuel and some paper to ensure combustion. The devices are small, highly portable, easily constructed and planted. They are nearly risk-free to the bomber as the timer can usually be set for up to 12 hours. The cost is less than 5 pounds to produce.<sup>66</sup> Thus far these bombs have caused more than \$15 million in property damage.<sup>67</sup> The process of planting the devices is typically a one person job, but allows that person potentially to operate without detection over a wide area and thus create an impression "of a concerted attack involving a large team."<sup>68</sup>

On a larger scale, bombs constructed out of ordinary, commercially-available fertilizer (such as was used in the World Trade Center bombing) have devastated commercial districts both in Northern Ireland and in England. In April 1992, in what was described "as the most powerful explosion in London since World War II," a bomb constructed with up to a ton of fertilizer exploded outside the Baltic Exchange building in the heart of the city's financial center, killing three persons, wounding 90 others, and leaving a 12-foot wide crater. It caused \$1.25 billion in damage.<sup>69</sup> Exactly a year later, a similar bomb devastated the nearby Bishops Gate district, killing one person and injuring 40 others. Initial estimates put the damage at \$1.5 billion.<sup>70</sup> Long a staple of PIRA operations, fertilizer costs on average 1 percent of a comparable amount of plastic explosive. However, after adulteration, fertilizer is far less powerful than plastic explosive. Semtex explodes at about 8,000 yards a second and has a high explosive rating of 1.3; improvised explosives explode at only about 3,000 yards a second and range between 0.25 and 0.8 in rating. It also tends to cause more damage than plastic explosives because the energy of the blast is sustained and less controlled.<sup>71</sup> Not surprisingly, therefore, the PIRA bombers have earned a reputation for their innovative expertise, adaptability, and cunning. "There are some very bright people around," the British Army's Chief Ammunitions Technical Officer (CATO) in Northern Ireland recently remarked. "I would rate them very highly for improvisation. PIRA bombs are very well made."<sup>72</sup> A similar accolade is offered by the staff officer of the British Army's 321 Explosives and Ordnance Disposal Company: "We are dealing with the first division," he said. "I don't think there is any organisation in the world as cunning

as the IRA. They have had 20 years at it and they have learned from their experience. We have a great deal of respect for their skills . . . not as individuals, but their skills."<sup>73</sup> While not yet nearly as good as the PIRA, the province's Loyalist terrorist groups are themselves reportedly on a "learning curve": becoming increasingly adept in the construction, concealment and surreptitious placement of bombs.<sup>74</sup>

Even attacks that are not successful in conventionally- understood military terms of casualties inflicted or assets destroyed can still be a success for the terrorists provided that they are technologically daring enough to garner media and public attention. Indeed, the terrorist group's fundamental organizational imperative is to act even if their action is not completely successful, but still brings them publicity. This imperative also drives the persistent search for new ways to overcome, circumvent or defeat governmental security and countermeasures. Thus, while the PIRA failed to kill then Prime Minister Margaret Thatcher at the Conservative Party's 1984 conference in Brighton, the technological ingenuity involving the bomb's placement at the conference site weeks before the event and its detonation timing device powered by a computer microchip nonetheless succeeded in capturing the world's headlines and providing the PIRA with a platform from which to warn Mrs. Thatcher and all other British leaders: "Today we were unlucky, but remember we only have to be lucky once--you will have to be lucky always."<sup>75</sup> Similarly, although the remote control mortar attack staged by the PIRA on No. 10 Downing Street--as Prime Minister John Major and his Cabinet met at the height of the 1991 Gulf War--failed to hit its intended target, the attack nonetheless successfully elbowed the war out of the limelight and shone renewed media attention on the terrorists, their cause and their impressive ability to strike at the nerve center of the British government even at a time of heightened security.<sup>76</sup> The PIRA's impressive ability to capture headlines with daring, clever operations was most recently demonstrated by the series of remote control mortar attacks on London's Heathrow Airport in March. Three attacks in five days nearly paralyzed all air traffic<sup>77</sup> and provided the terrorists with an ideal propaganda vehicle demonstrating terrorism's ineluctable paradox: that terrorists can attack anywhere at anytime while the government's security forces are powerless and unable to protect every conceivable target all the time.<sup>78</sup>

## **Conclusion.**

What do these trends suggest for the future? First, terrorists will continue to rely on the same two basic weapons that they have used successfully for more than a century: the gun and the bomb. What changes we will see will be more in the realm of clever adaptations or modifications to existing "off the shelf" technology (such as the PIRA is so accomplished at) or the continued utilization of readily-available, commercially- purchased materials that can be fabricated into crude--but lethally effective and damaging--weapons (such as the explosive device used by the World Trade Center bombers). Their preference for this traditional arsenal is a reflection of an operational conservatism imposed by the terrorist organizational imperative to succeed. For this reason, terrorists must always keep ahead of the technology curve. Thus, when confronted by new security measures, terrorists will seek to find and exploit new vulnerabilities or else simply change their tactics accordingly.



Second, the sophistication of these devices will be in their simplicity. Unlike military ordnance, such as plastic explosive, for example, the materials used in "home-made" bombs are both readily- and commercially-available, thus they are perfectly legal to possess until actually concocted or assembled into a bomb. These materials are also far more difficult to trace or for experts to obtain a "signature." For example, the type of explosive used in the 1988 in-flight bombing of Pan Am 103 was Semtex H, a plastic explosive manufactured in Czechoslovakia and sold primarily to other former-Warsaw Pact countries during the cold war as well as to such well-known state sponsors of terrorism as Libya, Iran, Iraq, Syria, and North Korea. Thus, for foreign governments seeking to commission terrorist attacks or use terrorists as surrogate warriors, the terrorists' use of such "home-made" materials carries with it both advantage and appeal in possibly enabling the state sponsor to avoid military retaliation or international sanction.

Third, a combination of the resurgence of terrorism motivated by a religious imperative, the proliferation of "amateur" terrorist groups, and the growing sophistication of established, more "professional" groups is likely to lead to higher levels of lethality and destruction than in the past. The erosion of the self-imposed constraints that have hitherto inhibited the infliction of mass, indiscriminate casualties by terrorists is evident in each of these categories. Indeed, terrorism today increasingly reflects a deadly mixture of all three: it is perpetrated by "amateurs"; motivated by religious enmity, blind hatred or a mix of individually idiosyncratic motivations; and conceivably exploited or manipulated by terrorist "professionals" and their state sponsors. In this respect, the availability of relatively sophisticated, off-the-shelf weaponry such as hand-held, precision-guided surface-to-air missiles, or the relative ease with which chemical or biological warfare agents can be manufactured, suggests that terrorists possessing this constellation of characteristics would have little trouble crossing into the domain of either "high tech" weaponry or weapons of mass destruction.<sup>79</sup>

Moreover, the post-cold war new world order and attendant possibilities and payoffs of independence, sovereignty, and power may entice both new and would-be nations along with the perpetually disenfranchised to embrace terrorism as a solution to, or vehicle for the realization of their dreams. Today, when old empires and countries are crumbling and new ones are being built, the possession of a nuclear bomb or the development of a chemical or biological warfare capability may thus become increasingly attractive either to new nations seeking to preserve their sovereignty or to would-be nations seeking to attain their independence. In both instances, terrorists may find new roles for their skills and expertise. Terrorists may be employed by countries either to steal nuclear weapons or strategic material from another country, or they may be paid to stage a covert nuclear, chemical, or biological attack to conceal the involvement or complicity of their state patron. In this respect, the lessons of Iraq's overt invasion of Kuwait loom large. In the future, terrorists may become the "ultimate fifth column": a clandestine, cost-effective force used to wage war covertly against more powerful rivals or to subvert neighboring countries or hostile regimes.

By the same token, ethnic/religious fanaticism--as previously noted--could more easily allow terrorists to overcome the psychological barriers to mass murder than could a radical political agenda. A

terrorist group of religious zealots, with state support, in a context of ongoing violence (i.e., the civil wars occurring in the former Yugoslavia or some new internecine conflict in one of the former Soviet Union's republics) could see the acquisition and use of a chemical, biological, or nuclear capability as a viable option. State sponsorship, in particular, could provide terrorists with the incentives, capabilities, and resources they previously lacked for undertaking an ambitious operation in any of these domains. Combined with intense ethnic enmity or a strong religious imperative, this could prove deadly.<sup>80</sup>

One final observation seems in order: while the volume of worldwide terrorism fluctuates from year to year, one enduring feature is that Americans remain favored targets of terrorists abroad. Since 1968, the United States has annually headed the list of countries whose nationals and property are most frequently attacked by terrorists.<sup>81</sup> This is a phenomenon attributable as much to the geographical scope and diversity of America's overseas commercial interests and the large number of its military bases on foreign soil as to U.S. stature as a superpower and leader of the free world. Terrorists, therefore, are attracted to American interests and citizens abroad precisely because of the plethora of readily available targets. Many terrorists believe that it is easier to operate against Americans overseas than it is to strike at targets in the United States. Furthermore, there is the symbolic value inherent in any blow struck against U.S. "imperialism," "expansionism," or "economic exploitation." Almost obligingly, the American press can be counted upon to provide publicity and exposure for any attack on an American target, especially if there are civilian casualties. These reasons suggest that, despite the end of both the cold war and the ideological polarization that divided the world, the United States will nonetheless remain an attractive target for terrorists seeking to call attention to themselves and their causes. Moreover, as the only superpower, the United States may likely be blamed for more of the world's ills, and therefore could be the focus of more terrorist attacks than before.<sup>82</sup>

Notes:

1. Michael J. Mazarr, et al., *Military Technical Revolution: A Structural Framework*, Washington, DC: Center for Strategic and International Studies, March 1993, p. 15. See also, Antulioi J. Echevarria and John M. Shaw, "The New Military Revolution: Post Industrial Change," *Parameters*, Winter 1992-93, pp. 70-79.

2. Wayne K. Maynard, "Spears vs. Rifles: The New Equation of Military Power," *Parameters*, Spring 1993, p. 149.

3. See, for example, *Ibid.*, pp. 55-56; and, Mazarr, et al., *Military Technical Revolution: A Structural Framework*, pp. 16-17.

4. This act was the opening salvo in the Marodnaya Volya's short-lived terrorist campaign against Tsarist rule. See Walter Laqueur, *Terrorism*, London: Weidenfeld and Nicolson, 1977, pp. 11-12.

5. *Ibid.*, pp. 12-13; and, Tom Pat Coogan, *The IRA: A History*, Niwot, CO: Roberts Rhinehart, 1993, p. 12.

6. Among the more noteworthy exceptions are: reports that in 1979

German Red Army Faction terrorists were being trained at Palestinian camps in Lebanon in the use of bacteriological weapons; the poisoning with mercury that same year of Israeli Jaffa oranges exported to Europe by Palestinian terrorists; a police raid of an RAF safe-house in Paris that uncovered a miniature laboratory containing a culture of *Clostridium botulinum*, used to create a botulinum toxin and earlier threats by the group to poison water supplies in 20 German towns if three radical lawyers were not permitted to defend an imprisoned RAF member; the 1984 meeting of white supremacists in Mountain Home, Arkansas, who, according to a Federal grand jury indictment, plotted and began to stockpile cyanide with which to poison the water supplies of Chicago and Washington, DC; suspicions that in 1986 terrorists in India may have contemplated poisoning drinking water tanks there; the letters sent to Western embassies by Tamil guerrillas claiming to have poisoned Sri Lankan tea with potassium cyanide; and the minute traces of cyanide discovered in Chilean grapes exported to the United States following threats made by a left wing Chilean group. Source: *The RAND Chronology of International Terrorism*. See also, Jeffrey D. Simon, *Terrorists and the Potential Use of Biological Weapons; A Discussion of Possibilities*, Santa Monica, CA: RAND, 1989, R-3771 AFMIC, *passim*. Also, it has been reported that various terrorist groups, including the RAF, Italy's Red Brigades and some Palestinian organizations, reputedly "have recruited microbiologists, purchased bacteriological experimentation equipment and dabbled in sending toxins such as anthrax to potential victims." See "Violence: A Buyer's Market," *Jane's Defence Weekly*, May 12, 1990, pp. 909-911.

7. Forty-four percent of all terrorist attacks between 1968/69 involved bombings; 53 percent in the 1970s; 49 percent in the 1980s, and 39.5 percent between 1990/93. Source: *The RAND Chronology of International Terrorism*.

8. Eighteen percent both between 1968/69 and during the 1970s; 19 percent in the 1980s; and, 32 percent between 1990/93. Source: *The RAND Chronology of International Terrorism*.

9. Hijackings accounted for 33 percent of all terrorist attacks between 1968/69; 7 percent in the 1970s; 4 percent of the incidents in the 1980s; and, 12 percent between 1990/93.

10. Three percent between 1968/69; 9 percent in the 1970s; 13 percent in the 1980s; and 13 percent between 1990/93.

11. Kidnappings accounted for just .01 percent of all terrorist attacks between 1968/69; 9 percent in the 1970s; 10 percent in the 1980s; and, 6 percent between 1990/93. There were no barricade and hostage situations recorded between 1968/69; though they accounted for 3 percent of all terrorist incidents during the 1970s; and just 1 percent in both the 1980s and between 1990/93.

12. This is the dramatic rise between 1990/93 of attacks on installations to 32 percent from the 19 percent recorded during the 1980s.

13. A bombing in Bessarabia in 1921; a 1925 bombing of a crowded cathedral in Sofia, Bulgaria; a largely unrecorded attempt to poison imprisoned German SS concentration camp guards shortly after World War II; the crash of a hijacked Malaysian passenger plane in 1977; the arson

attack at a Teheran movie theater in 1979 that killed more than 400; the 1983 bombing of the U.S. Marine barracks in Lebanon that killed 241; the 1985 in-flight bombing of an Air India passenger jet that killed all 328 persons on board; the simultaneous explosions that rocked an ammunition dump in Islamabad, Pakistan, in 1988; the bombing of Pan Am Flight 103 in 1988 that killed 278 persons; the 1989 in-flight bombing of a French UTA flight that killed 171; and the in-flight bombing, as in 1989, of a Colombian Avianca aircraft in which 107 persons perished. As terrorism expert Brian Jenkins noted in 1985 of the list upon which the preceding is an expanded version: "Lowering the criterion to 50 deaths produces a dozen or more additional incidents. To get even a meaningful sample, the criterion has to be lowered to 25. This in itself suggests that it is either very hard to kill large numbers of persons or very rarely tried." Brian M. Jenkins, *The Likelihood of Nuclear Terrorism*, Santa Monica, CA: RAND, P-7119, July 1985, p. 7.

14. Numbers derived from the analysis of incidents recorded in *The RAND Chronology of International Terrorism*.

15. Admittedly, many "secular" terrorist groups have a strong religious element: the Provisional Irish Republican Army, the various Armenian groups that were active throughout the 1970s and 1980s, and perhaps the Palestine Liberation Organization, as well. However, the political aspect is the predominant characteristic of these groups, as evinced by their nationalist or irredentist aims.

16. For a detailed analysis of these repercussions and indeed Iran's sponsorship of international terrorism, see Bruce Hoffman, "Recent Trends and Future Prospects of Iranian Sponsored International Terrorism," in Yonah Alexander, ed., *Middle Eastern Terrorism: Current Threats and Future Prospects*, New York and Toronto: G.K. Hall, 1994, or the *RAND Report*, R-3783-USDP, March 1990, in which this analysis was first published.

17. This form of terrorism has, of course, occurred throughout history, although in recent decades it has largely been overshadowed by nationalist/separatist or ideologically motivated terrorism. Indeed, as David C. Rapoport points out in his seminal study of what he terms "holy terror," the relationship between terrorism and religion is not new and until the 19th century "religion provided the only acceptable justifications for terror." See David C. Rapoport, "Fear and Trembling: Terrorism in Three Religious Traditions," *American Political Science Review*, Vol. 78, No. 3, September 1984, p. 659.

18. According to *The RAND Chronology of International Terrorism*, between 1982 and 1992 Shi'a terrorist groups committed 295 terrorist incidents but were responsible for 1,134 deaths.

19. For a more detailed analysis of the phenomena and implications of religious terrorism see Bruce Hoffman, "Holy Terror": *The Implications of Religion Motivated By A Religious Imperative*, Santa Monica, CA: The RAND Corporation, 1993, p. 6450.

20. According to a 1987 Federal grand jury indictment, 14 white supremacists met at a rural so-called "survivalist" compound in Mountain Home, Arkansas, in 1984 where they plotted to poison reservoirs in Chicago, Illinois, and Washington, DC, and began stockpiling 30 gallons of cyanide.

21. In 1987, the "Confederate Hammer Skins," a white supremacist "skinhead" group planned to place cyanide crystals in the air conditioning unit of a Dallas Jewish synagogue.

22. In 1984, two groups of Israeli Jewish fanatics plotted to blow up Jerusalem's Dome of the Rock, Islam's third holiest shrine, in hope of igniting a final battle between Moslems and Jews. Information provided to the author by an American law enforcement official. See also, Thomas L. Friedman, "Jewish Terrorists Freed By Israeli," *The New York Times*, December 9, 1984; Grace Halsell, "Why Bobby Brown of Brooklyn Wants To Blow Up Al Aqsa," *Arabia*, August 1984; Martin Merzer, "Justice for all in Israel?", *Miami Herald*, May 17, 1985; and, "Jail Term of Jewish Terrorist Reduced," *Jerusalem Post* (International Edition), October 12, 1985. The information pertaining to the terrorists' desire to provoke a cataclysmic holy war between Moslems and Jews was verified by an American law enforcement officer, involved with the investigation of Jewish terrorist incidents in the United States and knowledgeable of the Jerusalem incident. For a detailed account of both the Temple Mount "plot" and Jewish terrorist attacks on Arab targets in Israel during 1983 and 1984, see Ehud Sprinzak, *The Ascendance of Israel's Radical Right*, New York & Oxford: Oxford University Press, 1991.

23. In February and March 1993, Muslim terrorists allegedly unleashed a massive bombing campaign in downtown Bombay, India, that killed more than 400 persons and injured over a 1,000 others.

24. In 1984, followers of the Bagwhan Shre Rajneesh attempted to poison with salmonella the salad bars of a small Oregon town in hopes of influencing the outcome of a local election. Secular terrorists, it should be noted, have also attempted to poison food supplies, such as the Palestinian terrorists who poisoned Israeli oranges with mercury in 1979; the Tamil guerrillas who claimed to have contaminated Sri Lankan tea shipments in 1986; and, Chilean terrorists who claimed to have poisoned grapes exported from that country in 1988.

25. See, for example, Rapoport, "Fear and Trembling: Terrorism in Three Religious Traditions," p. 674.

26. Brian M. Jenkins, *The Likelihood Of Nuclear Terrorism*, Santa Monica, CA: The RAND Corporation, July 1985, P 7119, pp. 4-5.

27. See, for example, Amir Taheri, *Holy Terror: The Inside Story of Islamic Terrorism*, London: Sphere Books, Ltd., 1987, pp. 7-8.

28. These included the bombing of New York City's World Trade Center in February; the uncovering in June of a plot to free the terrorists arrested for the Trade Center blast by destroying two commuter tunnels and a bridge linking New Jersey to Manhattan, blowing up the United Nations building, staging a forced entry attack on the downtown Federal building housing the FBI's New York field office, and assassinating various public officials; the unmasking the following month of a conspiracy to carry out a machine gun and hand grenade attack against a prominent African American church in Los Angeles as Sunday services concluded; and the chain of bombings against a variety of Asian, Jewish, and African-American targets in the Sacramento, California, area last spring and summer.

29. In the case of the World Trade Center, the four bombers appear to have jointed forces based on their attendance at the same place of worship (a Jersey City, New Jersey, mosque). In one case as well, family ties existed. (Irbahim A. Elgabrownny, who although not charged with the Trade Center bombing specifically, was nonetheless implicated in the crime and has been charged in the subsequent plot to free the bombers, is the cousin of El Sayyid A. Nosair, who was also implicated in the bombing, is among the 15 persons indicted in the follow-on plans to obtain the bombers' release, and is already serving a prison sentence in connection with the November 1990 assassination of Rabbi Meir Kahane). See Jim Mcgee and Rachel Stassen-Berger, "5th Suspect Arrested in Bombing," *The Washington Post*, March 26, 1993; and, Alison Mitchell, "Fingerprint Evidence Grows in World Trade Center Blast," *The New York Times*, May 20, 1993.

30. For example, the arrests made in connection with the World Trade Center bombing brought to light further evidence that, since 1985, at least two other worshippers of the same Jersey City mosque that two of the convicted bombers attended had been previously implicated in terrorist acts in the New York metropolitan area. The first incident involves the arrest, in December 1985, of Sultan Irahim El Gawli, an Egyptian-born travel agent, by U.S. Customs Service officers. El Gawli was convicted of attempting to export 150 pounds of C-4 plastic explosives, 100 blasting caps, remote detonators and a 9-mm. silencer-equipped pistol to Palestinian terrorists in Israel and the Occupied Territories. He served 18 months in prison and has since been released. The second is the assassination of Rabbi Meir Kahane by El Sayyid A. Nosair, who also was born in Egypt and like El Gawli and the two World Trade Center bombing suspects--Mohammed Salameh and Nidal Ayyad--worshipped at the Masjid al-Salam Mosque in Jersey City. A search of Nosair's home following his arrest uncovered bomb making manuals, 1,440 rounds of 7.62 ammunition used in AK-47 assault rifles, manuals on the use of listening devices and explosive traps. See John Kifner, "Kahane Suspect Is a Muslim With a Series of Addresses," *The New York Times*, November 7, 1990; Mary B.W. Tabor, "Kahane Suspect Remains Focal Point in Bomb Plots," *The New York Times*, May 23, 1993; and, John J. Goldman, et al., "N.Y. Trial in Rabbi's Death Planted an Explosive Seed," *The Los Angeles Times*, July 4, 1993.

31. Interview with RAND research staff, November 1992.

32. Federal authorities reported that they had traced nearly \$100,000 in funds that had been wired to some of the suspects from abroad, including transfers made from Iran. An additional \$8,000 had been transferred from Germany into a joint bank account maintained by two of the bombers. Ralph Blumenthal, "\$100,000 From Abroad Is Linked to Suspects in the Trade Center Explosion," *The New York Times*, February 15, 1993. According to one of the other convicted bombers, Mahmud Abouhalima, funds had also been routed through the militant Egyptian Islamic group, Gamat al-Islamiya, whose spiritual leader is Shiekh Omar Abdel Rahman, now awaiting trial in connection with the June 1993 plot, and by the radical transnational Muslim Brotherhood organization. Additional financing reputedly was provided by and via Iranian businesses and Islamic institutions in Saudi Arabia and Europe. Mary B.W. Tabor, "Lingering Questions on Bombing," *The New York Times*, September 14, 1994.

33. Ralph Blumenthal, "Missing Bombing Case Figure Reported to Be Staying in Iraq," *The New York Times*, June 10, 1993.

34. According to Egyptian officials who interrogated Mahmud Abouhalima, who had fled the United States to his native Egypt following the bombing, the plan to attack the Trade Center was conceived in Afghanistan by veterans of the "holy war" waged against Soviet occupation of that country during the 1980s. Two "self-described Iranian intelligence agents" and the two Iraqi fugitives noted above had participated in the planning as well (Mary B.W. Tabor, "Lingering Questions on Bombing," *The New York Times*, September 14, 1994). Another of the convicted Trade Center bombers, Ahmad M. Ajaj, a Palestinian, had worked in a Houston pizzeria until he was arrested upon entering the United States from Pakistan on September 1, 1992. U.S. Customs agents found in his possession four false passports, six volumes of bomb-making manuals (that, according to prosecutors, contained formulas most likely used to construct the Trade Center bomb), as well as two videotapes demonstrating how to mix chemicals into explosives and how to stage a bombing attack against a U.S. Embassy (Richard Bernstein, "Trade Center Trial Nearing Close As Defense Team Rests Its Case," *The New York Times*, February 15, 1993). See also, Mary B.W. Tabor, "Terrorism in New York: Looking for Links," *The New York Times*, June 27, 1993; Richard Bernstein, "Trial Deepens the Mysteries Of the Trade Center Blast," *The New York Times*, November 15, 1993; Richard Bernstein, "4 Are Convicted In Bombing At The World Trade Center That Killed 6, Stunned U.S.," *The New York Times*, March 5, 1994; and, Richard Bernstein, "The Missing Piece," *The New York Times*, March 5, 1994.

35. Richard Bernstein, "Lawyer in Trade Center Blast Case Contends that Client Was a Dupe," *The New York Times*, February 16, 1994. See also, Tom Morganthau, "A Terrorist Plot Without a Story," *Newsweek*, February 28, 1994.

36. The Trade Center bomb was composed of some 1,200 lbs. of "common sulfuric and nitric acids used in dozens of household products and urea used to fertilize lawns." The detonating device was a more complex and extremely volatile mixture of nitroglycerine enhanced by tanks of compressed hydrogen gases that were designed to increase the force of the blast. Richard Bernstein, "Lingering Questions on Bombing: Powerful Device, Simple Design," *The New York Times*, September 14, 1994. See also, Richard Bernstein, "Expert Can't Be Certain of Bomb Contents at Trial," *The New York Times*, January 21, 1994. Richard Bernstein, "Nitroglycerin and Shoe at Center of Blast Trial Testimony," *The New York Times*, January 27, 1994; Richard Bernstein, "Witness Sums Up Bombing Evidence," *The New York Times*, February 7, 1994; Edward Barnes, et al., "The \$400 Bomb," *Time*, March 22, 1993; and, Tom Morganthau, "A Terrorist Plot Without a Story," *Newsweek*, February 28, 1994.

Similarly, in April 1988 a Japanese Red Army terrorist, Yu Kikumura, was arrested on the New Jersey Turnpike while en route to New York City on a bombing mission. Kikumura's mission was to carry out a bombing attack against a U.S. Navy recruiting station in lower Manhattan on April 15 to commemorate the second anniversary of the 1986 U.S. airstrike against Libya. He is believed to have undertaken this operation at the behest of Libya's Colonel Qaddafi. Between his arrival in the United States on March 14 and his arrest a month later, Kikumura traveled some 7,000 miles by car from New York to Chicago, through Kentucky, Tennessee, West Virginia, and Pennsylvania purchasing

materials for his bomb along the way. Found in his possession were gunpowder, hollowed-out fire extinguishers in which to place the explosive materials and roofing nails as crude anti-personnel weapons. Kikumura was sentenced to 30 years in prison. See Robert Hanley, "Suspected Japanese Terrorist Convicted in Bomb Case in New Jersey," *The New York Times*, November 29, 1988; and, Business Risks International, *Risk Assessment Weekly*, Vol. 5, No. 29, July 22, 1988.

37. N.R. Kleinfeld, "Legacy of Tower Explosion: Security Improved, and Lost," *The New York Times*, February 20, 1993; and, Richard Bernstein, "Lingering Questions on Bombing: Powerful Device, Simple Design," *The New York Times*, September 14, 1994.

38. See, for example, William M. Carley and Timothy L. O'Brien, "Web of Fear: New Kind of Terrorist, Amateur and Ad Hoc, Worried Authorities," *The Wall Street Journal*, March 17, 1993; and, Robin Wright, "New Breed of Terrorist Worries U.S. Officials," *Los Angeles Times*, June 27, 1993.

39. Israeli authorities have noted this same pattern has emerged among terrorists belonging to the Hamas organization currently active in the West Bank and Gaza Strip in contrast to the more professional, centrally controlled members of the mainstream Palestine Liberation Organization terrorist groups. As one senior Israeli security official noted of a particularly vicious band of Hamas terrorists: they "were a surprisingly unprofessional bunch . . . they had no preliminary training and acted without specific instructions." See Joel Greenberg, "Israel Arrests 4 In Police Death," *The New York Times*, June 7, 1993; and Eric Silver, "The Shin Bet's 'Winning' Battle," *The Jewish Journal* (Los Angeles), June 11-17, 1993.

40. Matthew L. Wald, "Figuring What It Would Take to Take Down a Tower," *The New York Times*, March 21, 1993.

41. United States of America v. Siddig Ibrahim Siddig Ali, et al., Complaint Violation of 18 U.S.C. §§ 371, 844 (i) June 23, 1993; United States District Court, Southern District of New York, United States of America v. Omar Ahmad Ali Abdel Rahman, et al., Indictment S3 Cr. 181, August 25, 1993. See also, Robert D. McFadden, "F.B.I. Seizes 8, Citing A Plot To Bomb New York Targets And Kill Political Figures," *The New York Times*, June 25, 1993; William C. Rempel and Ronald J. Ostrow, "Bomb Plot Reportedly Hinged on U.N. Link," *Los Angeles Times*, June 26, 1993; Robert D. McFadden, "U.S. Says More Bomb-Plot Suspects Are at Large," *The New York Times*, June 26, 1993; Susan Sachs, "Egypt Links Trade Center Blast to International Plot," *Los Angeles Times*, July 16, 1993; Mary B.W. Tabor, "Second Bombing Plot Casts Shadow as First Nears Trial," *The New York Times*, July 19, 1993; and, Mary B.W. Tabor, "U.S. Plotters Discussed Kidnapping and Hostage Taking," *The New York Times*, August 5, 1993.

42. Jim Newton, "Skinhead Leader Pleads Guilty to Violence, Plot," *Los Angeles Times*, October 9, 1993.

43. Information provided to author by one of the arresting police officers, August 1993.

44. Associated Press, "Blast Called Part of Plot," *Baltimore Sun*, July 31, 1993.



45. Associated Press, "California Teen Ager Is Arrested In Bombings Aimed at Minorities," *The New York Times*, November 8, 1993. See also, "White Supremacists Investigated In 4 Firebombings in Sacramento," *The New York Times*, October 6, 1993.

46. Quoted in Associated Press, "California Agency Hit In Hate Crime Attack," *The New York Times*, October 15, 1993.

47. The lethal simplicity of bomb-making was graphically demonstrated in a series of bombings carried out in upstate New York just after Christmas 1993 by an aggrieved boyfriend against his lover's family (who allegedly did not like him). Five persons were killed and two others wounded by booby-trapped plastic toolboxes manufactured by the boyfriend, a 53-year-old ex-convict, con-man and drifter, and a 56-year-old male accomplice. The bomber built prototypes of the explosive devices at his mother's house, before storing the real bombs in his accomplice's hotel room. The explosives used in the bombs had been obtained by the accomplice who was able to purchase a case of dynamite and 50 blasting caps in Kentucky using an alias. Jacques Steinberg, "Motive in Fatal Bombings Is Unclear, Authorities Say," *The New York Times*, December 31, 1993; and, Associated Press, "Judge Denies Bail for Two Men Suspected in Upstate Bombings," *The New York Times*, January 4, 1994.

48. See, for example, the discussion of Germany's Red Army Faction in Peter Schere, "RAF Concentrates on New Target Spectrum," *Die Welt*, December 18, 1991.

49. See Frederick Kempe, "Deadly Survivors: The Cold War Is Over But Leftist Terrorists In Germany Fight On," *The Wall Street Journal*, December 27, 1991.

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54. *Ibid.*

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78. Aphorism originally coined by Brian Jenkins.

79. According to a 1990 report, for example, "Canberra bombers, Rapier missiles and tube artillery" can be readily obtained on the international black market. It similarly notes that while terrorist groups as diverse as Germany's Red Army Faction, Italy's Red Brigades and various Palestinian organizations reputedly "have recruited microbiologists, purchased bacteriological experimentation equipment and dabbled in sending toxins such as anthrax to potential victims"; they have to date not done so. See "Violence: A Buyer's Market," *Jane's Defence Weekly*, May 12, 1990, pp. 909-911. See also, "Guns: Buyer's Market," *The Economist*, May 16, 1992.

80. Thesis originally advanced by the author in collaboration with Peter deLeon in *The Threat of Nuclear Terrorism: A Reexamination*, Santa Monica, CA: RAND, N-2706, January 1988.

81. Followed by Israel, France, Great Britain, West Germany, the Soviet Union, Turkey, Cuba, Spain, and Iran. Source: *The RAND Chronology of International Terrorism*.

82. One can envision ethnic, nationalist, and irredentist minorities turning to the United States for support and intervention which, if not provided, could act as a catalyst for increased anti-American terrorism designed to coerce the United States to intervene on their behalf or to punish it for not intervening. Of course, terrorism designed to protest or reverse U.S. intervention in local conflicts (such as was the case in Lebanon during the 1980s) is likely to continue as well.

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Commandant

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