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Is there likelihood of nuclear terrorism? Are any terrorist groups capable of "going nuclear"? This article, adapted from the introduction to A. Norton and M. Greenberg, eds. Studies in Nuclear Terrorism (Boston: G.K. Hall, forthcoming 1979), discusses the issue and finds hope that, for the foreseeable future, the problem is more likely to engage intellectuals than terrorists.

TERRORISTS, ATOMS AND THE FUTURE: UNDERSTANDING THE THREAT

by

Augustus R. Norton

Terrorism is an arm the revolutionary can never relinquish.

—Carlos Marighella¹

To the destruction of what is [.]

—The Professor²

The liberal governments of this world have increasingly come to find themselves attempting to cope with the extraordinary explosion of demands—both legitimate and illegitimate—that defines contemporary politics. For most of those who object to this or that policy, dissent takes constitutionally—or at least tacitly—acceptable forms. However, for a small segment of those rejecting not a policy or a particular government, but rather a regime and “established legality”³ itself, the language of dissent is violence and the

blunt instrument for its expression is all too often terrorism.⁴

Whether inspired by revolutionary ideals or the “logic” of anarchy, terrorists of today have inscribed themselves indelibly in the consciousness of the policymaker and the citizen alike. Although pursuing widely variant objectives, the myriad subnational organizations, anarchists, and misfits of this planet have found one indisputable common ground for agreement—the use of terrorism as a tactic for the achievement of any of a number of goals, including publicity, fundraising or simply praxis.

To date, terrorism, whether at the hands of *fedayeen* extremists or Italian anarchists or other terrorists, has been more important as a headline-grabber than as a destroyer of human life. This is all the more evidence of the quintessence of terrorism—symbolic violence for psychological and political effect.⁵ For example, it might be noted that the

world total of 375 deaths resultant of terrorist actions in 1974 (the record year to date) is considerably less than the U.S. highway fatalities for any recent year (e.g., 1976 fatalities totaled 46,700).⁶ Yet it is the terrorist extravaganza that holds our attention, not the carnage of the highway. In human terms the destruction wrought by terrorists has been appalling, and yet they have touched directly only the lives of very few. But as the world becomes inured to the murder of an Aldo Moro, to the slaughter of innocents who happen to be born of one nationality or another, to the maiming of those who respect a Pope rather than an archbishop, and to those who die because they just happen to be at the wrong place at the wrong time, will the "restraint" of today's terrorists give way to ever greater carnage wreaked by tomorrow's terrorists?⁷ Does the prologue obscure the future? Is there a mushroom-shaped cloud in our future, compliments of this or that extremist?

Such a prospect—the decision by terrorists to use nuclear weapons—is the focus of this paper.

I

Terrorism has been likened to the theater by a number of keen observers of the terrorist phenomenon (Brian Jenkins of the Rand Corporation may have originated the metaphor). Following the theater metaphor, a serious question is raised concerning this prospective variant of macroterrorism—the nuclear.⁸ Is it likely that the world will witness a mode of terrorism that stresses audience participation, or at least enlarges the cast, to levels never before experienced? This sort of question should be approached from a number of different perspectives in order to arrive at an acceptable (albeit tentative) understanding of the problem; however, before examining the pertinent points of inquiry systematically, it will be

useful to gain some perspective on the problem by citing several of the analyses that have been completed to date.

Thanks largely to the enthusiastic and incessant efforts of Theodore B. Taylor, a physicist and formerly a U.S. nuclear weapons designer, it is now widely believed that the civil nuclear fuel cycle has several keen vulnerabilities to the theft or diversion of nuclear explosive devices. Such devices would be crude nuclear devices with possible yields on the order of .1 kiloton (KT), a figure that has been revised downward from the 1KT and higher estimates that were widely circulated several years ago. Such a crude nuclear weapon would not satisfy a military planner but would represent a rather awesome increase in the firepower available to terrorist groups, or for that matter, criminals. Obviously, this is not a prospect to be taken lightly; however, as the following sections will demonstrate, the magnitude of the problem is anything but a matter of common agreement.

While many academics *qua* consultants have only recently discovered the prospect of the "unorthodox" use of nuclear weapons by subnational groupings or foreign agents, the problem has actually been recognized since the beginning of the nuclear age.

For example, the Jeffries Report written at the Metallurgy Lab of the University of Chicago in 1944 discusses the possibility of a "political group" unleashing a nuclear blitzkrieg, smuggling its weapons in commercial aircraft and secreting them in anticipation of the beginning of the attack.⁹ In a similar vein, Vannevar Bush, writing in 1949, discussed the possibility that a bomb might be hidden in the hold of a ship.¹⁰ In *The Absolute Weapon*, written in 1946, Bernard Brodie writes of the "new potentialities which the atomic bomb gives to sabotage . . ."¹¹ Or Harold Urey, cited by *The New Republic*, 31 December 1945 as having said:

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An enemy who puts twenty bombs, each with a time fuse, into twenty trunks, and checked one in the baggage room of the main railroad station in each of twenty leading American cities, could wipe this country off the map so far as military defense is concerned.

More recently Roberta Wohlstetter writes of the "... superficial sense of *deja vu* which affects any look at the possibility that some subnational group or even an individual entrepreneur might use nuclear terror."^{1 2}

Yet 33 years have passed, and as with the apocalyptic musings concerning nuclear war, nuclear terrorism is still, thankfully, a matter of conjecture rather than history. Why? Why has it not happened? We can look to several explanations. Brodie's, for example, that "the bomb itself is a highly intricate and fairly massive mechanism..." "Not one which can be slipped into a suitcase." But, even as Brodie recognized in 1946, a simpler device could perhaps be developed (while we might note, one that still was dependent upon the same principles of physics). Nor might we be very comfortable with the tradition of non-experience with nuclear terrorism, for as Thomas Schelling has observed: "Of course, this could be one of those traditions that, being absolute, is discredited at the first violation."^{1 3} We need to determine whether the "absolute tradition" will be abandoned, and the route to that answer is the determination of discontinuities as well as continuities.

Perhaps to this stage in the nuclear age there has been a simple lack of motivation, skill or even publicity concerning the possibility of nuclear terror. Perhaps no self-respecting terrorist had given the idea any thought. Indeed, "[s]ometimes the genie must be pushed out of the bottle,"^{1 4} by those who most want to protect us. Or, as some

authorities hold, it might just be that the technical means are only now becoming widely available, and at a juncture in the chronicle of terrorism when terrorism itself may be becoming more gruesome. The following factors should be considered:

Contemporary terrorism has emerged as a major and oft-used tool for the weak to defeat the strong. "Public protest by bomb and by bullet rather than by ballot has become an all-too-familiar symbol of the last decade."^{1 5}

As Roberta Wohlstetter suggests, the socialization of contemporary terrorists has included exposure to military strategies that coolly weigh the destruction of millions of civilians, as exemplified in the so-called "counter-value" targeting strategies.^{1 6} This brand of "humanism" is captured nicely by John Newhouse, who in describing the "counter-value doctrine" observes "killing people is good, killing missiles is bad."^{1 7} Furthermore, any inhibition to aggression that might result from face-to-face contact between victim and attacker has been precluded by the impersonal nature of the technology of modern warfare.^{1 8}

The spread of nuclear technology in the form of civil nuclear power programs, and in particular the dispersion of technologies necessary for the production of bomb-making material, has made the basic materials more accessible. Most important is the sale of reprocessing technologies that provide the capability of separating plutonium produced during normal reactor operations from the irradiated (i.e., spent) fuel rods removed from the reactor^{1 9} to states with somewhat unstable political systems. Such sales have been made by Germany to Brazil, and France to Pakistan.

The Atoms for Peace program, which in 1965 "led to declassifying 10,000 United States Atomic Energy Commission documents..., and over half a million by 1972,"^{2 0} increased the open literature immensely. Many such

documents would be of great assistance to those concerned with nuclear weapons design and fabrication. As one Department of Energy official commented recently: "With the advent of terrorist threats, it seems possible that much unclassified information in the nuclear area may be useful to terrorists."²¹

The large numbers of personnel who have been or are employed in atomic energy industries increases the pool of skilled labor that might be tapped to produce an illicit bomb. One estimate puts the total requirement for trained engineers by the international nuclear industry at 115,000 by 1980.²²

It is frequently suggested that at least a few of the technical experts might "desert" to the terrorists. There is one reported case of a highly placed German, Dr. Klaus Traube who had "... access to all blueprints for nuclear power plants in West Germany," who was dismissed from this position as a result of extended contacts with terrorist personalities.²³

Finally, to reiterate, the proliferation of books, articles, studies, monographs and speeches intended to warn us of the problem, has also alerted (and challenged) terrorists to the possibility. As Roberta Wohlstetter notes: "It is even barely possible—as those who have recently warned us recognize—that advertising the technical feasibility will raise the probability."²⁴

II

More than any other work, the Ford Foundation study by Mason Willrich and Theodore Taylor, published as *Nuclear Theft: Risks and Safeguards*,²⁵ has prompted the heightened public attention²⁶ to the possibility of nuclear terror. Taylor in particular has crusaded to alert the public of the alleged ease with which even one technically competent individual might fabricate a crude nuclear device.

Nuclear Theft has spawned a predictable spate of journal articles, monographs and popular treatments (and in fairness, this very article). Even the field of fiction has begun to capture the theme, although there has been little creative movement beyond the pot-boiler.²⁷ J. Bowyer Bell's (himself the author of four recent books on terrorism and revolution) comment on this facet of the "terrorism" phenomenon is well to the point.

Inevitably, it appears that the analysis of terror will continue to be a growth industry regularly supplied with additional spectaculars by the practitioners. The prospect of all these essays and articles dense with notes, and survey books and monographs on obscure bombers, should strike terror in the mind of the common reader.²⁸

In an attempt to avoid being intimidated by the sheer volume of literature on the subject, a useful approach is to locate central tendencies in the literature. While much of the serious non-fiction on the question of nuclear terror differs significantly in content and emphasis, it is possible to identify two distinct tendencies, or schools of thought that encompass the major points in contention. On the one hand, the "realists' school" examines motives, feasibility and historical evidence; and on the other hand, a "faith bloc," so named because it seems to accept the likelihood of nuclear terrorism as a matter of fatalistic faith, or at least as a concession to expert opinion.²⁹

The "faith bloc" literature characteristically proceeds as follows: The possibility of acquisition of fissile materials, hence nuclear explosive devices provides the *motive* for terrorists to find or compile the *capabilities* to carry out the *threat* of nuclear terrorism.³⁰ These concepts are explained and applied below. Following this line of reasoning, we might conceive of the prospective

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nuclear terrorist as a mountain climber who will climb the plutonium precipice simply because it is there.

This tendency to proceed from the feasibility of acquisition to a presumptive motive was recognized by Roberta Wohlstetter in her superb essay "Terror on a Grand Scale," when she observed:

Arguments for paying more attention to nuclear terrorism proceed by showing mainly that it would be *feasible* for a lone individual or a small group to steal or make and deliver a crude weapon, that there might be *some motive*, and that it would be *terrible* if it happened. This demonstration may be enough to warrant greater care in nuclear safeguards, but it does not offer much of a basis for judging the probability of such an event. . . . But in any case, the analysis of possible motives is generally rather thin and not much attention has been devoted to the viewpoint of the terrorist, the alternatives they have, and their psychological and political pathologies. [Emphasis original]³¹

This stress upon the acquisition element, characteristic of the "faith bloc," is particularly evident in the work of Theodore Taylor, but even more so in the analyses by David Rosenbaum, David Krieger, Forrest Frank and Louis Beres, each of whom will be cited below.

The difficulty with this acquisition-oriented approach is that it presents the problem of nuclear terrorism as if it were discrete from the rational decision-making framework likely to be used by the prospective terrorist perpetrator; however, the two elements are intertwined rather than independent of one another. Ignoring the consequences and the objectives of an act of terror for the terrorist is to risk misunderstanding terrorism itself. As David Fromkin

reminds us, terrorism "... achieves its goals not through its acts but through the response to its acts."

In any other such strategy of violence, the violence is the beginning and its consequences are the end of it. For terrorism, however, the consequences of the violence are themselves merely a first step and form a steppingstone toward objectives that are more remote.³²

Thus, whether nuclear terrorism is indeed a real "mega-threat"³³ turns on technical feasibility *plus* the likelihood that terrorists will want to make the attempt given the possible favorable and unfavorable consequences of the act and the objectives of the terrorists.

This does not for a moment presume, by the way, that terrorists will be guided by rationality in the normative sense, for Paul Wilkinson is probably correct in his warning: "It would be a great mistake to assume that political terrorists will conform to some minimum standard of rationality and humanity."³⁴ We are concerned however, with "rationality" in the utilitarian sense, that is, in the context of instrumental, goal-oriented behavior, and thus we distinguish the political terrorist (and the criminal for that matter) from the psychopath whose vicarious enjoyment of destruction as an end in and of itself is irrational except in the strictest mechanical sense. For the rational actor, including the terrorist, goals exist beyond the act.

These points are not new to some identified with the faith bloc, but they tend to denigrate such factors in the face of the assumption that terrorists will "do it." Thus, Louis Rene Beres acknowledges the trade-off between costs and benefits as follows: "No less than states, terrorist groups chose between alternative courses of action by assessing the perceived consequences of each course in cost-benefit terms."³⁵ But Beres, like many others, does not

believe that the current costs are sufficient to deter the terrorist from a nuclear strategy. This is an important divergence and one to which we will return in time.

Proceeding within the schema employed by the faith bloc, the matter of acquiring or constructing a nuclear weapon is the key point of interest. Therefore, the question of technical feasibility needs to be squarely addressed. To do so the following sorts of questions will lead the inquiry in the right direction: How difficult is bomb construction? How many people might we expect to find on a bomb-building team? What skills must the fabricators possess? How long would the project take from start to finish? How long after the fissile explosive material is obtained (stolen, diverted, etc.) might the bomb be ready for use?

Beres in his 1975 paper, "The Nuclear Threat of Terrorism," appears to be the most optimistic (or should it be "pessimistic"?) in addressing the complexity of the technology that must be conquered. He asks: "How difficult is the design of a nuclear explosive?" "Not very," he answers. In fact, "... nuclear weapons are relatively easy to make."³⁶ Similarly, William Epstein, in a widely read book about nuclear proliferation, informs his readers that "it is not very difficult to make a bomb."³⁷ We need not be considered overly skeptical to ask, "relative to what?"

These answers are simply unsatisfactory. For more precision, we can turn to Forrest Frank, who gives us cause to gaze suspiciously at that earnest college student who spends his days in the chemistry lab, the physics classroom or under the vast geodesic domes of our engineering schools: "... the amount of expertise needed to construct a bomb is perhaps no greater than that derived from college physics, chemistry, and perhaps engineering..."³⁸ Or we might turn to David Rosenbaum who believes that the skills necessary for the

construction of a bomb are quite common.

People with the skills needed to build crude nuclear weapons are easily found in the general technical community. Someone with the experience in calculating fast neutron systems would be useful, as would a physical chemist and an explosives expert. There are thousands of people with appropriate skills in physical chemistry and explosives. Thus, most established organizations, given enough time, should be able to acquire appropriate people.³⁹

The technical barriers to nuclear weapon construction are not that high according to Willrich and Taylor. "It is difficult to imagine that a determined terrorist group could not acquire a nuclear weapon manufacturing capability once it had the required nuclear weapon materials."⁴⁰ Furthermore, Taylor has consistently held that just one person could accomplish the task.⁴¹ Following Taylor, it is worthwhile to take note of one "do-it-yourselfer" who produced a bomb design—only a step along the way to weapons capability—and was featured in the Public Broadcasting System program NOVA. This celebrated M.I.T. student was offered as proof-positive that the threat of nuclear terror was real indeed. The message that the NOVA program got across was that bomb design and construction were relatively simple, and to substantiate the claim, a Swedish scientist favorably evaluated the student's blueprint for the program. Alas, the view of the scientist was rather more restrained than the unwary television viewer might have concluded from listening to the edited broadcast. Roberta Wohlstetter, quoting a letter from the scientist, shows that the student's efforts were rather more a qualified success than a resounding victory.

... a. design of the bomb was primitive; b. several essential

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features were forgotten; c. the student might not survive the fabrication of the bomb; d. should he survive, the probability that the bomb would go off upon "pressing the button" would be less than 50%; e. should a nuclear reaction start, the explosion yield would be very small. The probability that the device would yield as much as 0.1-kt would be very small; f. if a group of qualified scientists or a professional defector were granted more time and better means, including the possibility to undertake experiments, the bomb would be much better⁴²

J. Carson Mark, a celebrated physicist long involved with military-related nuclear activities, was called upon by the Senate Committee on Government Affairs in March 1978 to evaluate yet another amateur design derived from unclassified sources. Mark did not foreclose the possibility of a successful bomb-construction effort, but he did find several problems with the design at hand.

There is not in [the individual's] work, in my view, sufficient awareness of some of the difficulties . . . in actually realizing the apparatus to perform in the way which he has said it would need to perform or that it would perform. This, of course, doesn't prove anything; because it remains true that I suppose [the designer], and certainly several people thinking as carefully as he has thought, could bring into reality such an apparatus.⁴³

Clearly, one would be foolish to deny that a group of intelligent individuals could successfully design and construct a nuclear weapon, but it would seem that there has been some denigration of the sophistication required. This reminder is especially important when it is recognized that most terrorists—while

well-educated, with at least some university training being the norm—have pursued studies in the humanities and the social sciences, rather than the exact sciences.⁴⁴

Perhaps the core of the matter was best captured by an unidentified commentator in *The Curve of Binding Energy* (a popularized treatment of Theodore Taylor's views), who commented as follows: "[Taylor] seems to think that anyone could do it, but that is not so. If you wanted to make a bomb, you would need a Ted Taylor."⁴⁵

It is now becoming clear that the scientific community is considerably more skeptical concerning the prospect than Taylor and Mark. One authoritative view is offered by the Nuclear Energy Policy Study Group, which recently completed a major study, sponsored by the Ford Foundation. The group concluded:

The difficulty of designing, planning, and constructing a crude weapon from reactor-grade plutonium should not be underestimated.

After extensive planning, many months of intense work would be involved to produce a weapon. Even in a well-planned effort, there is a good chance that the weapon would fail to detonate or that the group would suffer fatal accidents during its construction. Prospects for success would be somewhat enhanced if terrorists could operate freely enough within a society to test the high explosive parts of the weapon.⁴⁶

This view is shared by Robert Kupperman, Chief Scientist for the Arms Control and Disarmament Agency, who states:

Although terrorists could conceivably obtain materials and technology to manufacture a crude fission bomb, this is a difficult and dangerous task—they are

more likely to turn to readily available chemical or biological weapons.⁴⁷

Despite some of the more restrained authoritative analyses of the problem, the supposed ease of making a nuclear explosive device is still widely accepted as expert opinion, with scarce attention directed to evaluating such a conclusion. Some of the enthusiastic advocates of the faith bloc present us with a series of scenarios that might even stretch the imagination of the Saturday matinee crowd. Take for example that offered by Rosenbaum:

A nuclear facility near a metropolitan area could be captured by a terrorist group which threatened to cause an explosion releasing large amounts of radioactive material into the atmosphere. If the facility contained more than a WQ [weapon quantity] of *easily usable* SNM [special nuclear material], they might, given sufficient time, even construct a nuclear explosive on the site. Properly used, such an explosive could greatly increase the amount of radioactive material dispersed and the area over which it was dispersed.⁴⁸

Leaving aside methods of access to the site, motives, size of the group and other details, we must ask the following:

What is "easily usable SNM"? Reactors in commercial use do not use highly enriched (i.e., weapons grade) uranium, and military facilities present difficult (though not insurmountable) problems of access.⁴⁹ If the reactor at the facility uses MOX (i.e., mixed oxide fuels containing plutonium), and none in current or planned operation will,⁵⁰ the plutonium would be in the form of pellets or slugs loaded into fuel rods. If a fresh reload was standing by, the terrorists would have to disassemble the fuel rods and chemically process the fuel pellets to extract the plutonium.

This is not an insurmountable task, but one requiring a portable laboratory of some sophistication. If a fresh reload is not available, the fuel rods in use will be "hot," i.e., highly radioactive and quite dangerous if not handled with the proper remote control equipment and shielding. The irradiated, i.e., spent, fuel rods will be stored in a cooling pool. They are self-protecting in the sense that they are very "hot" and quite lethal to the unprotected. Will the terrorists arrive with their own remote control apparatus in tow?

How will the terrorists separate the plutonium from the spent fuel? Will they reprocess on site? (Even Taylor admits that the reprocessing threshold is significant for the terrorist.⁵¹) It is appropriate to note J. Carson Mark's comments on just one of the laboratory procedures that the illicit bomb maker might confront, in this case reducing plutonium oxide or uranium oxide to plutonium or uranium in metallic form. While he allows that there are handbooks that provide the information for the processes in question, the procedure would not be easy for the inexperienced.

It must be realized that these [the handbooks] are really in the nature of cookbooks. It is as if I should have Julia Child's book here in my hand and, reading carefully line by line, expect to come out with a galantine. It takes more than those instructions. It takes experience and it takes a feeling, really quite a broad awareness, to go from the kinds of statements available in the plutonium metals handbook to achieve plutonium metal. It is often claimed that this is an easy, straightforwardly available process for an inexperienced individual to follow. I think that statement is usually made by people who have never done it.⁵²

How long will the weapon fabrication take? Many discuss bomb design

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and construction in periods of months or longer. The Nuclear Energy Policy Study Group refers to "... months of intense work." What are the security officials and forces doing while all of this is going on? Is it reasonable to expect that the terrorists will hold them at bay for the months necessary to construct a device?

Clearly, Rosenbaum's assumption is that bomb fabrication is a simple and speedy process. This does not go too far beyond Taylor's comments. In a 1977 article, Taylor asserts that terrorists with the know-how can be within "... days or even hours" of weapons capability; all they have to do is complete the process.⁵³

We have already noted that Taylor speaks in terms of a .1KT yield from a crude nuclear bomb. In their enthusiasm, many of those writing on the subject have greatly increased the possible yield. Epstein, for example in *The Last Chance*, writes about a 15KT bomb at one point⁵⁴ and of a weapon in the megaton range at another.⁵⁵ Rosenbaum presents a casualty estimate of one million (Wall Street on a business day) based upon 20KT weapon. (Curiously, Rosenbaum's estimate is based on a letter from Taylor, who himself estimates the weapon would be in the subkiloton range.⁵⁶)

Krieger by contrast offers a panoply of targets, some more realistic than others, for which the terrorists might consider their bomb appropriate.

Terrorists could threaten the destruction of any number of key targets, including a nation's capital city, a major dam, or even a nuclear power generating station.⁵⁷

Such speculation on likely targets should be weighed against the damage estimates that Taylor and Willrich provide for a .1KT weapon (a yield often argued to be within terrorist capabilities). It should be understood from the onset that weapons yield is probabi-

listic, and even government specialists can do no better than predict the likely yield. The error in the yield of a small crude weapon might be as high as one order of magnitude. With this in mind, we note the following figures: a .1KT weapon would produce radiation fatalities to a range of nearly 500 meters, it would create at least moderate structural damage as far away as 300 meters, and it would cast fallout perhaps as far as one kilometer away. If the weapon were only .01KT, the ranges would be more than halved; similarly, they would be approximately doubled for a 1KT weapon.⁵⁸ Yes, the damage would be awesome with such targets as the Sears Tower or the World Trade Center vulnerable indeed to a well-placed weapon. Yet, it must also be acknowledged that the destruction of a city or a nation is far out of the reach of any nonstate nuclear terrorist.

III

It is posited by several authorities that the nuclear terrorist could place a modern society such as the United States or Canada peculiarly at risk as the "logic of deterrence" is not relevant to the threat. Thus, the threat of nuclear retaliation would be futile against the elusive terrorist.⁵⁹ Notwithstanding that many terrorists "have many of the vulnerabilities of governments,"⁶⁰ it is hard to understand why the posited asymmetry receives such prominent attention. Can we explain the phenomenon of aircraft hijacking by virtue of the fact that the states victimized may not counter by hijacking terrorist flag-carriers? To get to the point, to deter someone from doing something does not require counteraction in kind, i.e., in the precise form of the action. In order to deter a terrorist who is not already dissuaded by organizational costs from the nuclear path it would seem that one would want to impose the prospect of unacceptable and

credible costs ("punishments" such as capture, death, destruction of the organization, etc.) and not nuclear retaliation. Furthermore, may it be inferred that where terrorists would be vulnerable to nuclear attack that the "logic of nuclear deterrence" should be brought into play? Obviously, no. Careful consideration yields no other conclusion.

IV

It is frequently posited that terrorist groups might be provided a nuclear explosive device—for any of a number of reasons—by the authorities of a state (typically a radical one). However, it should be noted that there is something of an analytical problem here. Although the problem may be somewhat amorphous, it is nonetheless important; specifically, at what point does government-sponsored terrorism cease being perceived as the action of an organization and instead begin to be perceived as the policy of the state? The line is not easily drawn; however, it is probably drawn at the nuclear level at least. This is a key point because states sponsoring terrorists are subject to a range of coercive measures that may not be effective against terrorists. For this reason, it appears that the likelihood of nuclear weapons being transferred to a terrorist group has been—to be kind—rather overdrawn.

Rosenbaum, for example, notes that the U.S.S.R. might provide a nuclear weapon to terrorists.⁶¹ This totally ignores the fact that the Soviets have been most conscious of precedent in international affairs (e.g., hesitation on the issue of Jewish emigration from the U.S.S.R.), and furthermore have not been entirely supportive of terrorism (as distinguished from "revolutionary violence").⁶²

David Krieger, arguing along similar lines, admits that stealing nuclear weapons from a government would likely be difficult unless the power of the

revolutionary force approached that of the government," but

(f)ar simpler would be to convince a sympathetic government to give one or more weapons away. We can imagine, for example, another Middle Eastern nation clandestinely creating nuclear weapons in the same way Israel is purported to have done and then turning some of them over to a terrorist group⁶³

There are a few obvious problems with such supposition. First is the matter of risk for the donor who would be foolish to deliver the weapon(s) unless the transfer could be forever secret. Second is the faulty analogy provided, in that a state developing weapons "in the same way as Israel" would not allow for the confirmation of the existence of its weapons, but would foster the suspicion as to their existence (as Israel does with great skill). Maintaining secrecy in such circumstances is probably not possible. Similar objections can be raised to Krieger's assertion that ". . . the nuclear weapon may be given to the terrorist group as payment for other activities the national leader wants accomplished. Such an agreement would most likely be secret . . ." For how long?⁶⁴

We may not be in total agreement with Ted Greenwood when he argues that: "All states have an interest in maintaining a taboo against non-state possession of nuclear weapons and in punishing and suppressing its violators."⁶⁵ But most states share such an interest, and for those that do not, the cost of nonconformity could well be dear indeed.

V

It has been argued to this point that the goal-oriented behavior of terrorists may reflect unsavory motives and tactics, but that such behavior is nonetheless instrumental in form. What remains

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is to examine the types of considerations that are likely to influence a decision by terrorists to attempt a resort to nuclear weapons. Rather than presuming a motive for a terrorist group to seek a nuclear capability, the terrorists' moral, purposive and ideological underpinnings must be taken into account. The variables and concepts to be surveyed are depicted in figure 1.

a. Ideological considerations: There is certainly no consensus among those who have thought seriously about the terror-violence problem about the fruitfulness of studying the ideological underpinnings of this or that terrorist group. On the one hand are those like Paul Wilkinson who argue that the failure to examine terrorists' ideologies is a "fatal flaw" in most analyses.⁶⁶ On the other hand we find Arnold Beichman, for example, who argues that such an approach is likely to plow a fallow plot. "With possible exceptions such as the PLO and the IRA, terrorist 'programs' are nonexistent, therefore, non-negotiable. *There is no way of studying terrorist ideology in any meaningful way.*" [Emphasis added.]⁶⁷

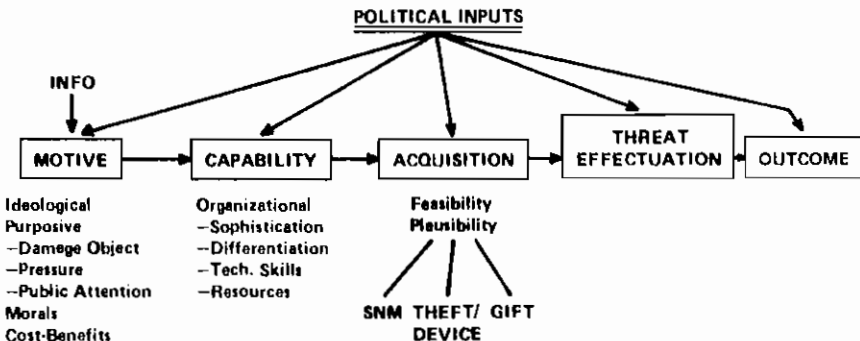
Some accommodation between these two polar extremes is probably wisest. It is doubtlessly true that some terrorist groups simply do not betray any discernible ideology beyond the most facile parroting of a Sartre, a Marcuse or a Marighella. Admittedly then there are

those, much like the characters in Paul Theroux's *Family Arsenal*, who do it for the thrill of it. And yet, respective ideologies may provide an injunction for particular types of terrorist actions. For example, Bernard K. Johnpoll, in his very competent treatment of terrorism in the United States, discusses the theoretical basis for violence put forth by Johann Most, the 19th-century anarchist, wherein Most argued that terror was "the only means available for overthrowing the oppressive system and making the new Utopia secure . . ."

Peripherally, Most and his followers argued that terror was essentially less oppressive than the continuation of the present system, that at least as many persons had died under the present system as would die during a period of terror, and that death from privation under the present system was far worse than death by assassination. This was to remain, with some modification, the basic philosophic argument for terror in the United States.⁶⁸

Most's philosophy of violence should be contrasted to that of Sartre, who would present us with a milieu of perpetual (albeit "liberating") terror. For Sartre, notes Paul Wilkinson:

Any killing or cruelty committed in the name of revolution is its own justification: the end justifies the means, the means



justify the end; terrorism becomes an addition, an obsession, a way of life, and the act of murder a sacramental duty.^{6,9}

Alternatively, a number of terrorist groups have espoused theories of violence or ideologies that do not justify the killing of innocents, or at least provide an impelling injunction to minimize deaths.^{7,0} Some terrorists, at least, have agreed with Camus: "No cause justifies the unnecessary death of the innocent." As Thomas Thornton noted in his influential article:

The terrorist must always have the distinction between *apparent* indiscrimination and *actual* indiscrimination clearly in mind, if he is to succeed. As a general rule, it may be said that terror is most effective when it is indiscriminate in appearance but highly discriminate in fact. [Emphasis original.]^{7,1}

Many terrorists would agree that no cause justifies the *unnecessary* death of the innocent, although necessity and innocence are often oddly construed. This injunction is reinforced by ideology for some, but it is likely to be a strategic consideration as well, given the importance of the maintenance of at least a minimal base of support or sympathy (whether coerced or genuine). Thus, even if the ideology that inspires (or merely justifies) the terrorist abets the gratuitous destruction of the innocent, strategic considerations operate against senseless slaughter, particularly on the scale that we contemplate in the macroterror context.

b. **Purposive aspects:** Closely related to the ideological considerations cited above is an examination of the purposes for which an act of terror-violence is committed. For the political terrorist we expect to find a purpose that transcends the act itself, although this purpose is likely to be more pronounced in the case of such groups as the

Palestine Liberation Organization than the latter-day nihilists typified by the Red Brigade. For example, when Fritz Trufel, a Baader-Meinhof gang member, said that "it is better to bomb a store, than to run one,"^{7,2} it was obvious that any objective beyond destruction was quite obscure. Naturally, one confronts considerable ambiguity when considering groups that pursue destruction for its own end as their damage objectives may represent the earliest stirrings of a terror campaign for political objectives or merely the spasmodic flailing of the disaffected against a society that they have come to abhor. The difficulty is not so great, however, when the tactics chosen are more clearly associated with discrete objectives. Here, of course, we refer to pressure/coercive objectives and publicity objectives.

Even where there is considerably more ambiguity than heuristic models or taxonomies might imply, it is still important to attempt this distinction between tactics and objectives. For this distinction allows us to identify those whose terrorism is purposeless, those who seek objectives that presuppose the destruction of the existing political and social systems, and those whose aims presuppose only some restructuring of the political system. Following the categorization offered by Conor Cruise O'Brian, it is frequently the "millenarian" groups (typically of an anarchistic or a nihilistic bent) who conceive of tactics amorphously, only vaguely justifying them as a means toward the "destruction of what is." While "secessionist/irredentist" groups (e.g., the PLO and the I.R.A.) seek concrete objectives—frequently in the form of incremental concessions—beyond the tactics of terror violence that they employ.^{7,3} It is the secessionist/irredentist terrorists who are most concerned with the attentions and the concessions of those whom they attack. This is not to say that millenarians do not seek publicity or carry out horrendous acts

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of coercion, rather it is to point out that the millenarians' "utopian" objectives presuppose the coidentity of terror and liberty, a position that allows minimal compromise and scant accommodation. The situation is not nearly so stark with those who seek less than a millenium.

Certain categories of targets are likely to be perceived as desirable objectives *ipso facto* among both types of terrorists, but the destruction of the masses would not be so perceived. For the absolutist, as well as the secessionist/irredentist, the murder of large numbers of civilians is simply unattractive. Notwithstanding the risks for the organizations, very little is to be gained by killing many, so long as the death of a few is newsworthy. As Brian Jenkins has asserted, "the objective of terrorism is not mass murder." "Terrorists want a lot of people watching and a lot of people listening, not a lot of people dead."⁷⁴ The difference between the murder of a few innocents and genocide is so obvious that those who would see a relationship between the two can only be ignoring the very dynamics of terrorism. Thus, an objection must be raised to Paul Wilkinson when he offers the following proposition: "If any individual life is expendable in the case of 'Revolutionary Justice' or 'Liberation' so may hundreds, even thousands, of lives have to be 'sacrificed.'"⁷⁵ The quantitative difference between the one and the other is so massive as to signify a qualitative distinction between assassination and murder, and mass murder. This is a distinction that has not gone unrecognized. As R. Mengel notes: "The terrorist that would resort to the direct application of new technologies causing uncontrolled, indiscriminate casualties and damage has not appeared."⁷⁶

Targets more clearly identified with an offending government are likely to be more acceptable under "desirable objective" rubric. Thus, al-Fatah is likely to see the destruction of an Israeli military installation as a "good" in

itself. Especially when dealing with targets of high symbolic value, however, it is usually more productive to threaten damage and make a suitable and proportionate demand, rather than destroying the target and receiving nothing for the effort—save publicity. Pathologically, coercion tends to replace destruction. Frequently, a terrorist organization will begin its career with a destructive act (or series of acts) in order to establish its credibility, and then attempt to achieve subsequent objectives through coercion. In large part, such "infantile" acts as bombing are simply easier, requiring far less in the way of sophistication and organizational skills, as well as fewer risks of course. Attacks by the Puerto Rican F.A.L.N. against corporate and financial institutions in the United States probably illustrate this evolution in its (extended) infantile stages, while the Irgun of Mandatory Palestine exemplified the "mature" coercive stage, as the activity of the fedayeen organizations frequently do today. It is also frequently the case that destruction of a given target may be symptomatic of near or total failure. Such acts may be structured as retaliation or retribution or simply frustration (e.g., the assassination of Herr Martin Schleyer in the fall of 1977).

Terrorism is theater; it is intended to be effective and affective beyond those who are central players. Accordingly, a major objective of the terrorists' coercive attempts will be to apply adequate pressure in order to bring about a change of policy, prevent an undesired change, or otherwise achieve important concessions. For example, the fedayeen hijacking of a Dutch KLM airliner on 25 November 1973 had the purpose of forcing the Dutch Government to change its pro-Israel stance. The Dutch concession—tailored to meet the terrorists' demands and save the airplane and passengers—was to stop formerly sanctioned aid for Soviet Jews emigrating through Holland to Israel.⁷⁷ The Dutch

concessions were intended to prevent damage; if the aircraft had been precipitously destroyed, there would have been no reason to so concede.

In addition to the preceding factors that are more or less associated with concrete demands or objectives, it may often be the case that the terrorists want, more than anything else, to call attention to their existence. Thus, the search for the attention of the public figured very strongly in the actions of the fedayeen, particularly the PFLP, in the interregnum between the 1967 and the 1973 Middle East wars. This objective of gaining attention is also explained by the need to maintain organizational vitality and recruitment and to enhance the images of respective terrorist groups in regions where there are contending groups. This latter aspect is keenly illustrated by the rush to claim credit for "successful" terrorist operations.

c. **Morals:** It might appear at first ironical to associate morals and morality with terrorism; however, historically there has been such a link. Unfortunately, the link has been by several indications broken. The "political code" that marks off the official from the citizen is no longer in place. "Randomness is the crucial feature of terrorist activity" according to Michael Walzer.⁷⁸ The moral standard exhibited by the Russian revolutionaries who plotted to kill Grand Duke Sergei in the early part of this century is now conspicuous by its absence. New Left revolutionaries are not wont to join the Russian anarchist of earlier days in saying: "Even in destruction, there's a right way and a wrong way—and there are limits."⁷⁹ Instead we are more likely to hear that "morality, like politics, starts at the barrel of a gun."⁸⁰ (But note, while a gun can be the tool of indiscriminate murder, it is not inherently an indiscriminate weapon.)

This is a disturbing discontinuity that clearly implies that morality is not

likely to be a hindrance to macroterror. This being said, it must be recognized that when the history of terrorism is surveyed it is the instances of mass killing that suggest themselves, not because they are the norm, but rather the exceptions that prove the rule. The rule being: terrorists avoid mass killings not out of moral fervor or altruism, but because such tactics poorly serve their purposes and may even be—in fact, they usually are—counterproductive to say the least. "The group that used or threatened to use nuclear terror might murder its own cause in the process."⁸¹

d. **Cost-benefits ratio:** Benefits (rewards) are never valued absolutely by the typical terrorist, but relative to the prospective cost of their attainment. As with many of the other aspects of our heuristic model, this factor will not only be operative at the *motive* stage, but will continue to be influential throughout the model. Particularly with the case of nuclear weapons, the terrorist is likely to be sharply conscious of the risks (costs) associated with their acquisition and utilization.

There are several levels of risks likely to affect any cost-benefit calculation; these range from risks to the individual terrorist to those that have an impact upon the organization. At the individual level the terrorist is not always inclined to participate in risky operations, hence one explanation for the widespread use of bombs by terrorists. Despite stereotypes to the contrary, terrorists have in large part avoided high-risk operations, leading R.W. Mengel to discuss the "nonsuicidal nature of terrorism."⁸² Mengel perhaps overdraws the generalization, but he is far closer to being correct than many who might take the contrary view. Brian Jenkins has perhaps best captured the role of risk in terrorists' calculations when he observed:

Terrorists rarely assaulted facilities when there was a high

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probability that they might be defeated before they gained entry, but they were willing to assume high risks after they had gained entry and barricaded themselves.⁸³

The implication that Jenkins' remark holds for nuclear power facilities is of course obvious.

We have already made several comments about the organizational risks that a macroterror strategy might hold for the perpetrators. However, there are several additional organizational costs that should be expressly stated. First, for "successful" terrorist groups, terror reaches a point wherein further terrorism becomes counterproductive. As Thornton notes:

If the terrorists already enjoy a high level of active support, terror will not only be wasteful of energy and moral authority but may have a negative effect by endangering the orientation of those already included within the insurgents' activities.⁸⁴

Secondly, terror might well become too successful in the sense that terrorism could serve as an inadequate surrogate for action on a wider scale. This is both a practical concern and an ideological dictum that is likely to be most influential for those who hew closest to a Marxist line. This possibility was recognized over 60 years ago by Leon Trotsky, when he wrote:

In our eyes, individual terror is inadmissible precisely because it *belittles the role of the masses in their own consciousness*, reconciles them to their powerlessness, and turns their eyes and hopes toward a great avenger and liberator who some day will come and accomplish his mission.⁸⁵

Finally, it is difficult to conceive of any attainable terrorist objective that could not be achieved with a more efficient and less costly use of organizational assets than the nuclear gambit

would require. There is clearly a limit to what a terrorist group could demand in the context of blackmail. The point is quickly reached when the concession demanded grossly exceeds the implementation of coercion.

e. **Capability and Acquisition:** The two factors are closely linked. When the aspects of capability are considered, the concern is essentially with the organizational characteristics of the group in question. Thus, the focus is upon the sophistication of the group in terms of the differentiation of skills intragroup, the level of technical skills evidenced, and the resources—both internally generated and externally provided—available to the group. Thomas Schelling offers the Jewish terrorist organizations as the prototype for the type of sophistication and skills that the group must possess.⁸⁶ Such a prototype is not today emulated by any known terrorist group. Furthermore,

... non-state entities are likely to use a nuclear weapon in inverse proportion to their ability to obtain one and ... those most able to acquire nuclear weapons would probably use them, if at all, in a manner calculated to minimize destruction.⁸⁷

The question of acquisition turns on the application of the group's capabilities. Thus, in the present case, questions must be pondered concerning the feasibility of the group constructing a nuclear device given its capabilities. For those groups without the capability of constructing a nuclear weapon (all or nearly all), the plausibility of certain techniques of acquisition become important. Specifically, the provision of fissile explosive materials or even an intact device, or alternately the theft of a device.⁸⁸ As noted in the earlier sections, there are acute problems for the aspiring nuclear terrorist with each mode of acquisition.

f. **Threat Effectuation:** This refers to the operationalization of the threat, which may range from a hoax to the actual detonation of a device. The terrorist will be concerned with the credibility of his threat, and the security of his forces prior to, during, and after the threat is carried out (if necessary). None of these matters is insubstantial.

Nuclear terror may be associated with a negative threat. Specifically, instead of demanding that something be done, the terrorist might withhold his weapon as long as certain actions will not be taken.^{8,9} In fact, it is precisely this possibility that strikes many, particularly of the realist school, as the most serious nuclear terror threat. Such a shift from coercion to dissuasion would make it far easier for the victim government to concede to the terrorist's demands, as it would merely be a matter of not doing something, rather than undoing something already accomplished.

Such a tactic could be keenly effective were the threat to be made secretly. "It would probably look more like diplomacy than terrorism."¹⁰

...the conceding state could avoid a public announcement that it "caved," while the terrorist group could maintain its base of international support, especially where the support is contingent upon peaceful vis-a-vis armed struggle.¹¹

g. **Outcome:** Refers to the terrorist's expectations of the results of his act, as well as the actual or predicted outcome. From the terrorist's perspective, the analysis of outcome is analytically indistinguishable from the purposive aspects of the motives. In real life, of course, the outcome is beyond the control of any single actor or group of actors. Ergo, an important segment of the terrorist's analysis must be the likely effect of an undesirable outcome. That is to say, if the threat fails or is

thwarted, what will the resultant effects be upon the terrorist actors? Must the possibility of death, torture or imprisonment be considered? If so, are the terrorists willing to accept such a possibility? Probably not, "... terrorists do not usually engage in activity that involves the risk of confrontation, capture or a fight to the death."¹²

Furthermore, the terrorist may also contemplate the possibility that his actions may result in far more widespread damage than may have been desired. "The new transnational television terrorists want media exposure, not exposure of the masses to radio-active fallout."¹³

VI

The thrust of this analysis is not to dismiss glibly the possibility of nuclear terrorism, but to critique that which has been produced to date on the subject and to offer a more precise investigation than has been customary. By highlighting the disincentives and technological problems that will inhibit a resort to macroterror of the nuclear sort, it is possible to identify more starkly those actors to which the negative factors are not likely to be controlling. Thus, rather than perceiving the world population of terrorists as wholly comprised of aspirants to nuclear status, it is now possible to discriminate between the nonaspirants (the vast preponderance) and the aspirants. And, as J. Bowyer Bell observes: "The mix of motive, military and technological skills, resources and perceived vulnerability simply does not exist."¹⁴

For the foreseeable future, we can be thankful that the nuclear terror problem is more likely to engage intellectuals than terrorists. This is not a justification for complacency however; we must be constantly alert to the threat, and especially thankful to those who, like Theodore Taylor, provided impetus for us to insure that nuclear materials are

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treated with the respect they deserve. As Yehezkel Droz reminds us, the problem must be taken seriously (and we should add, considered carefully).

... those who regard such possibilities as too science fiction-like to deserve serious consideration should be reminded that science fiction is in a crisis because so many ideas which thirty or forty years ago were considered as pure science fiction have been realized. Therefore, the possibility of non-country units getting hold of a few primitive nuclear devices is one which should be taken seriously, though it is less probable than the possibility of crazy countries achieving a limited nuclear capability.^{9 5}

The likelihood of nuclear terrorism is the controversial question debated here. The optimism, if one can rightly use "optimism" in this context, is the result of a careful, and one should hope, an accurate examination of the problem.

To this point, it may be correctly asserted that those terrorists who are most desirous of adding the adjective "nuclear" are probably the least capable, while the most capable groups—all secessionists/irredentists—would lose rather than gain from such a tactic... but the future holds no guarantees, and it is here that the controversy lies.

BIOGRAPHIC SUMMARY



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NOTES

1. Carlos Marighella, "Minimanual of the Urban Guerrilla," *Urban Guerrilla Warfare*, Adelphi paper, no. 79 (London: International Institute for Strategic Studies, August 1971), p. 36.

2. A character in Joseph Conrad, *The Secret Agent* (Garden City, N.Y.: Doubleday, 1907, 1921), quote at p. 249.

3. The phrase "established legality" is from Herbert Marcuse, *An Essay on Liberation* (Boston: Beacon Press, 1969), whose work has justified if not in part inspired the terrorism of the radical left. The appropriate quotation follows:

An opposition which is directed, not against a particular form of government or against particular conditions within a society, but against a given society as a whole, cannot remain legal and lawful because it is the established legality and the established law that it opposes.

p. 66.

4. This does not mean, however, that terrorism has become "more practical and legitimate" [emphasis added] as Bruce G. Blair and Garry D. Brewer argue in "The Terrorist Threat to World Nuclear Programs," *Journal of Conflict Resolution*, September 1977, pp. 379-403.

5. "... terror is a symbolic art designed to influence political behavior by extranormal means, entailing the use or threat of violence." [Emphasis omitted.] This important definition is from Harry Eckstein, ed., *Internal War: Problems and Approaches* (New York: Free Press, 1964), pp. 71-99.

6. Respective sources: Yonah Alexander and Seymour M. Finger, eds., *Terrorism: Interdisciplinary Perspectives* (New York: John Jay Press, 1977), pp. 213-214; and the National Safety Council.

7. According to Martha C. Hutchinson, "[t]he lessons of the past indicate that the trend toward greater harm will continue." See Alexander and Finger, p. 304. See also Robert H.

Kupperman, "Facing Tomorrow's Terrorist Incident Today," a report prepared for the Law Enforcement Assistance Administration, Washington, D.C., October 1977, p. 50.

8. Radiological weapons and sabotage of nuclear facilities are excluded from the present inquiry for defensible reasons: first, radiological weapons are analytically undistinguishable from other gruesome agents of the chemical and biological genre, and they should therefore be so considered. This is not to say that the threat resultant of the possibility that such agents can find their way into terrorists' hands is less important than the terrorist nuclear bomb variant, but only that such a threat should be considered discretely from the atomic bomb issue. Second, concerning the exclusion of attacks upon and sabotage of nuclear facilities, such tactics more properly belong to a discussion of attacks upon high-value targets or inherently dangerous facilities. (For a rather different view see: Michael Flood, "Nuclear Sabotage," *Bulletin of the Atomic Scientists*, October 1976, pp. 29-36.)

An important discussion of radiological, chemical and biological options for terrorists can be found in Robert K. Mullen, "Mass Destruction and Terrorism," *Journal of International Affairs*, Spring/Summer 1978, pp. 63-89.

9. Alice Kimball Smith, *A Peril and a Hope* (Chicago: University of Chicago Press, 1965). (Formally known as the "Prospectus on Nucleonics," submitted to Arthur M. Compton on 18 November 1944.)

10. Vannevar Bush, *Modern Arms and Free Men: A Discussion of the Role of Science in Preserving Democracy* (New York: Simon and Schuster, 1949), pp. 154, 137-157.

11. Bernard Brodie, *The Absolute Weapon* (New York: Harcourt Brace, 1946), p. 46.

12. Roberta Wohlstetter, "Terror on a Grand Scale," *Survival*, May/June 1976, pp. 98-104. She also reproduces additional statements of foreboding.

13. Thomas Schelling, "Who Will Have the Bomb?" *International Security*, Summer 1976, pp. 77-91.

14. Augustus R. Norton, "Nuclear Terrorism and the Middle East," *Military Review*, April 1976, pp. 3-11.

15. Robert A. Friedlander, "Sowing the Wind: Rebellion and Violence in Theory and Practice," *Denver Journal of International Law and Policy*, Spring 1976, pp. 83-93. See also Friedlander, "Terrorism and Political Violence: Do the Ends Justify the Means?" *Chitty's Law Journal*, vol. 24, 1976, pp. 240-245.

16. Wohlstetter, p. 100.

17. John Newhouse, *Cold Dawn: The Story of SALT* (New York: Holt, Rinehart, Winston, 1973), p. 176.

18. See for example Paul Wilkinson, *Political Terrorism* (New York: Wiley, 1974), p. 135.

19. See for example Albert Wohlstetter, et al., *Moving Toward Life in a Nuclear Armed Crowd?* (Los Angeles: Pan Heuristics, 1976).

20. R. Wohlstetter, p. 100.

21. U.S. Congress, Senate, Committee on Governmental Affairs, *An Act to Combat International Terrorism*, Hearing (Washington: U.S. Govt. Print. Off., 1978), p. 280.

22. Lewis Dunn, "Nuclear 'Gray Marketeering,'" *International Security*, Winter 1977, pp. 107-118. In footnote 7, Dunn cites unconfirmed reports to the extent that 200 European nuclear engineers "cognizant of plutonium reprocessing technology presently are consulting in less developed countries."

23. *The New York Times*, 1 March 1977, p. 6. Dr. Traube's alleged contacts were with Hans-Joachim Klein, who participated in the December 1975 terrorist raid on the OPEC meeting in Vienna; and, Mehdi Khanbaba-Fheherani, a left-wing Iranian extremist leader. An interesting twist to this episode is the *San Francisco Chronicle* report of 17 August 1978, page 20, which indicated that Klein is being protected by the Israeli Secret Service in a Negev-desert kibbutz. This latter report has not been otherwise confirmed.

24. R. Wohlstetter, pp. 99-100.

25. Mason Willrich and Theodore Taylor, *Nuclear Theft: Risks and Safeguards* (Cambridge, Mass.: Ballinger, 1974).

26. Naturally, "private" attention to the problem has become quite intense as well. Brian Jenkins, for example, notes that "... about 40 percent of the Rand Corporation's total research on terrorism has dealt with the question: Will terrorist go nuclear?" See "Research Note: Rand's Research on Terrorism," *Terrorism*, no 1, 1977, pp. 35-95. The scope of classified research on the problem is alluded to by Kupperman.

27. See for example Uri Dan and Peter Mann, *Ultimatum: Pu 94* (New York: Leisure Books, 1977). Reportedly the late Congressman Ryan finished a first-rate novel with a nuclear terror theme prior to his tragic death, *San Francisco Chronicle*, 27 November 1978, p. 4.

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28. J. Bowyer Bell, "Trends on Terror: The Analysis of Political Violence," *World Politics*, April 1977, pp. 476-488.

29. E.g., Forrest Frank: "My own view is that nuclear terrorism is probably inevitable." We need not be Hegelians to believe that history will end, but man's epoch consists of a number of lifetimes. If such "predictions" are to have any meaning, they must be tied to some specific and relevant time. It is futile, or at least not useful, at this point to argue that some event will occur in history. Forrest Frank, "Nuclear Terrorism and the Escalation of International Conflict," *Naval War College Review*, Fall 1976, pp. 12-27. Similar objections can be raised to C.L. Sulzberger, who stated in *The New York Times*, 22 October 1977, p. 21: "Once—and it is inevitable—a modern terrorist group gains possession of even a crude nuclear device, nobody can foresee how it will be used." Or we might consider Willrich and Taylor, who state on p. 169:

One wonders how in the long run nuclear power industries can develop and prosper in a world where terrorist activities are widespread and persistent. For if present trends continue, it seems only a question of time before some terrorist organization exploits the possibilities for coercion which are inherent in nuclear fuel. [Emphasis added]

30. Talia Ben-Gal of the University of Chicago deserves credit for this formulation. Ben-Gal participated in the early drafting of this paper.

31. R. Wohlstetter, pp. 99-100.

32. David Fromkin, "The Strategy of Terrorism," *Foreign Affairs*, July 1975, pp. 683-698.

33. "Mega-threat" is drawn from David Comey, "The Perfect Trojan Horse," *Bulletin of the Atomic Scientists*, June 1976, pp. 33-34.

34. Paul Wilkinson, *Terrorism and the Liberal State* (New York: Wiley, 1977), p. 49.

35. Louis Rene Beres, "International Terrorism and World Security," *Stanford Journal of International Studies*, v. XII, 1977, pp. 131-146.

36. Louis Rene Beres, "The Nuclear Threat of Terrorism," a paper presented at the Thirteenth North American Peace Science Conference of the Peace Science Society (International), Cambridge, Mass., 10-12 November 1975.

37. William Epstein, *The Last Chance* (New York: Free Press, 1976), p. 268.

38. Frank, p. 13.

39. David Rosenbaum, "Nuclear Terror," *International Security*, Winter 1977, pp. 140-161.

40. Willrich and Taylor, p. 115.

41. See for example Ted Greenwood, et al., *Nuclear Proliferation: Motivations, Capabilities and Strategies for Control* (New York: McGraw-Hill, 1977), especially p. 136.

42. R. Wohlstetter, p. 103. Another celebrated amateur, John A. Phillips has recently published his "memoirs," *Mushroom: The Story of the A-Bomb Kid* (New York: Morrow, 1978).

43. U.S. Congress, p. 259.

44. Charles A. Russell and Bowman H. Miller, "Profile of a Terrorist," *Military Review*, August 1977, pp. 21-34. Iranian and Turkish terrorists tend to be exceptions at one extreme, as they do tend to be educated in technical fields (in particular engineering); at the other extreme is the Provisional IRA which has an almost negligible component of intellectuals.

45. John McPhee, *The Curve of Binding Energy* (New York: Ballantine Books, 1973), p. 122.

46. Report of the Nuclear Energy Policy Study Group, *Nuclear Power Issues and Choices* (Cambridge, Mass.: Ballinger, 1977), p. 305.

47. Kupperman, p. 11. On this point see also Norton and Mullen.

48. Rosenbaum, pp. 144-145.

49. Troublesome loopholes in weapons security procedures have been exposed however. See Joseph Albright's series in the *Atlanta Journal-Constitution*, 8, 15 and 22 January 1978.

50. The exclusion of plutonium-based fuels is resultant of President Carter's decision of 7 April 1977 not to proceed with plutonium reprocessing in the United States. See *The New York Times*, 8 April 1977, p. 1.

51. Greenwood, et al., p. 140.

52. U.S. Congress, p. 257.

53. Greenwood, et al., p. 140.

54. *Ibid.*, p. 263.

55. *Ibid.*, p. 268.

56. Rosenbaum, p. 145. Rosenbaum tends to exaggeration, or at least hyperbole: "... a crude nuclear device as the perfect terrorist: a chance to hold an entire nation hostage," pp. 152-153. If that is possible with a .1KT, or even a 20KT weapon, the United States and the U.S.S.R. have been wasting their money for years.

Taylor himself often varies his data. E.g., the level of enrichment in the isotope U^{235} necessary to have weapons suitable material is variously given as over 10 percent, over 20 percent, published by U.S. Naval War College Digital Commons, 1979

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57. David Krieger, "What Happens If . . . ? Terrorists, Revolutionaries, and Nuclear Weapons," *Annals of the American Academy of Political and Social Science*, March 1977, pp. 44-57.
58. Willrich and Taylor, p. 23.
59. See for example Greenwood, et al., p. 138; and Krieger, p. 50.
60. A. Wohlstetter, et al., p. 171. The quote is drawn from a section written by Harry Rowan.
61. Rosenbaum, p. 146.
62. The Soviets' reluctance to support terrorism has been a major stumbling block in U.S.S.R.-fedayeen relations. The interested reader may consult Augustus R. Norton, *Moscow and the Palestinians* (Miami: Center for Advanced International, 1974).
63. Krieger, p. 47.
64. Norton, "Nuclear Terrorism and the Middle East," p. 7; and Mullen, at p. 85: ". . . such employment could very likely precipitate countermeasures of such severity as to topple the government associated with the act."
65. Greenwood, et al., pp. 79-107.
66. Wilkinson, p. 96. It should be noted that the term "ideological aspects" is being used to encompass ideology, creeds, systems of thought and programs. This usage diverges from that of Edward Shils, for example, who distinguishes ideology from the other patterns of belief (see Shils' contribution on ideology in the *International Encyclopedia of the Social Sciences*); however, it is consistent with the formulations of other sociologists, most notably Karl Mannheim.
67. Arnold Beichman, "A War Without End," *The American Spectator*, April 1978, pp. 20-23.
68. Yonah Alexander, ed., *International Terrorism: National, Regional, and Global Perspectives* (New York: Praeger, 1976), pp. 30-45.
69. Wilkinson, p. 77.
70. E.g., the *Narodnaya Volya*, the Russian anarchist group active in the late 19th century.
71. Thomas Thornton, "Terror as a Weapon of Political Agitation," in Eckstein, ed., pp. 81-82.
72. Cited in Jillian Becker, *Hitler's Children* (New York: Lippincott, 1977), p. 89.
73. Conor Cruise O'Brian, "Liberty and Terrorism," *International Security*, Fall 1977, pp. 56-57.
74. Brian Jenkins, "International Terrorism: A Balance Sheet," *Survival*, July/August 1975, pp. 158-164. "A credible threat, a demonstration of the capacity to strike, may be from the terrorists' point of view often preferable to actually carrying out the threatened deed, which may explain why, apart from the technical difficulties involved, terrorists have not done some of the terribly damaging and terrifying things they could do, such as poisoning a city's water supply, spreading chemical or biological agents, or other things that could produce mass casualties."
75. Wilkinson, p. 203.
76. R.W. Mengel, "Terrorism and New Technologies of Destruction: An Overview of the Potential Risk," *Disorders and Terrorism* (Washington: Law Enforcement Assistance Administration, December 1976), pp. 443-473.
77. Lester A. Sobel, ed., *Political Terrorism* (New York: Facts on File, 1975), p. 67.
78. Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations* (New York: Basic Books, 1977), p. 197. For the "political code" see the chapter on terrorism, pp. 197-206.
79. From a character in Camus, "The Just Assassins," *Caligula and Three Other Plays* (New York: Viking Press, 1958), p. 258.
80. Andrew Kupkind, *New York Review of Books*, 24 August 1967.
81. David C. Gompert, et al., *Nuclear Weapons and World Politics: Alternatives for the Future* (New York: McGraw-Hill, 1977), p. 251.
82. Mengel, p. 460.
83. Brian Jenkins, et al., *Attributes of Potential Criminal Adversaries to U.S. Nuclear Programs* (Santa Monica: RAND Corporation, 1979), p. xiii.
84. Thornton, p. 74.
85. Leon Trotsky, "On Terrorism," November 1911, reprinted in *Leon Trotsky: Against Individual Terrorism* (New York: Pathfinder Press, 1974), p. 7.
86. Schelling, p. 84.
87. Greenwood, et al., p. 104.
88. See Norton; Dunn; and Lewis Dunn, et al., *Routes to Nuclear Weapons: Aspects of Purchase or Theft* (Croton-on-Hudson, N.Y.: Hudson Institute, April 1977).

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90. Schelling, p. 86.

91. Norton, p. 9. Kupperman concurs on this point, see: "Treating the Symptoms of Terrorism," *Terrorism*, vol. I, 1977, pp. 35-49.

92. Mengel, p. 460.

93. J. Bowyer Bell, *A Time of Terror: How Democratic Societies Respond to Revolutionary Violence* (New York: Basic Books, 1978), p. 121.

94. *Ibid.*

95. Yehezkel Dror, *Crazy States: A Counterconventional Strategic Problem* (Lexington, Mass.: Heath Lexington Books, 1971), pp. 52-53.

