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The Atomic Terrorist?

By John Mueller

This article is an excerpt from John Mueller's newest book The Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda *(Oxford, 2010). He is the Woody Hayes Chair of National Security Studies and Professor of Political Science at Ohio State University.*

In the wake of 9/11, concerns about potential atomic terrorists surged, even though the terrorist attacks of that day used no special weapons. Oddly, given these concerns, it appears there has been an inability or unwillingness to consider the difficulties confronting the atomic terrorist. Thus far terrorist groups seem to have exhibited only limited desire and even less progress in going atomic. This may be because, after brief exploration of the possible routes to go atomic, they, unlike many alarmed pundits, have discovered that the tremendous effort required is scarcely likely to be successful.

There are three routes through which terrorists might pursue an atomic weapon. One route would be to be given or sold a bomb by a generous like-minded nuclear state for delivery abroad. A second option, which analysts have voiced great worry about, is "loose nukes"—weapons, "suitcase bombs" in particular, that could be stolen or bought illicitly. However, the most plausible route for terrorists would be to manufacture the device themselves from purloined materials—states with return addresses are unlikely to trust their precious bombs to groups they cannot fully control and no "loose nukes" appear, actually, to exist. This is the course identified by a majority of leading experts as the one most likely to lead to nuclear terrorism. Accordingly, this is the method evaluated here (For reasons of space, this discussion leaves out many details and assumptions that are covered in depth in *Atomic Obsession*).

The likely product of such an effort would not be a bomb that can be dropped or hurled, since this would massively complicate its delivery. Rather, the terrorists would seek to come up with an "improvised nuclear device" of simple design, one that could be set off at the target by a suicidal detonation crew. The process is a daunting one even in this minimal case. The terrorists would confront enormous technical and logistical obstacles. In particular, the task requires that a considerable series of difficult hurdles be conquered in sequence.

To begin with, at the present time and likely for the foreseeable future, stateless groups are simply incapable of manufacturing the required fissile material for a bomb, because the process requires an effort on an industrial scale. Moreover, they are unlikely to be supplied with this material by a state, primarily due to the states' concern for their own survival. Thus, they would need to steal or illicitly purchase this crucial component.

Known thefts of highly enriched uranium have totaled less than six pounds or so. This is far less than required for an atomic explosion; for a crude bomb, over 100 pounds are required to produce a likely yield of one kiloton. If terrorists were somehow successful at obtaining a sufficient mass of relevant material, they would then have to transport it hundreds of miles out of the country over unfamiliar terrain and probably while being pursued by security forces. Once outside the country with their precious booty, terrorists would need to set up a large and well-equipped machine shop to manufacture a bomb, and then populate it with a very select team of highly skilled scientists, technicians, and machinists. Under the best of circumstances, the process could take months or even a year or more, and it would all, of course, have to be carried out in utter secrecy even while local and international security police are likely to be on the intense prowl.

The finished product could weigh a ton or more. Encased in lead shield to mask radioactive emissions, it would then have to be transported to, and smuggled into, the relevant target country. However transported, the dense and remarkably heavy package would then have to be received within the target country by a group of collaborators who are at once totally dedicat-

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is dedicated to promoting peaceful resolutions to the nuclear crises in North Korea and Iran. It aims to provide policy makers with analysis on the latest developments in both nations and options for formulating coherent U.S. responses. In highlighting the importance of achieving diplomatic solutions, the goal is to avoid armed conflict and its attendant consequences.

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ed and technically proficient at handling, maintaining, detonating, and perhaps assembling the weapon after it arrives.

Another issue is the financial costs of the extended operation in all its cumulating, or cascading, entirety. These could easily become monumental. Any criminals competent and capable enough to be an effective ally in the project are likely as well to be at once smart enough to see boundless opportunities for extortion and psychologically equipped by their profession to be willing to exploit them. In one analysis, Peter Zimmerman and Jeffrey Lewis suggest the entire caper could be pulled off for $10 million. This seems to understate the costs wildly. The cost of the operation in bribes alone could easily become ten times this sum. And even at that, there would be a considerable risk that those so purchased would decide to take the money and run.

In fact, there is a lengthy set of obstacles confronting the would-be atomic terrorist. Those who warn about the likelihood of a terrorist bomb contend that a terrorist group could, if often with great difficulty, surmount each obstacle—that doing so in each case is "not impossible." But it is vital to point out that, while it may be "not impossible" to surmount each individual step in constructing an atomic device, the likelihood that a group could surmount a series of them could quickly approach impossibility.

To gain some additional feel for how daunting the task is, one could assign probabilities to each barrier and then see how easy or difficult it would be, given those estimates, for a terrorist to fabricate and then explode an atomic device. Assigning a probability that terrorists will be able to overcome each barrier is, of course, a tricky business, and any such exercise should be regarded as rather tentative and exploratory, or perhaps simply as illustrative—though it is done all the time in cost-benefit analysis.

An atomic terrorist would have to successfully overcome the barriers described above—and others, 20 in all—to accomplish their mission (see Appendix A). One might begin a quantitative approach by adopting probability estimates that purposely, and heavily, bias the case in the terrorists' favor. In my view, this would take place if it is assumed that the terrorists have a fighting chance of 50 percent of overcoming each of the 20 obstacles. Even with that generous bias, the chances that a concerted effort would be successful comes out to be less than one in a million. If one assumes, somewhat more realistically, that their chances at each barrier are one in three, the cumulative odds they will be able to pull off the deed drop to one in well over three billion. What they would be at the (still entirely realistic) level of one in ten boggles the mind.

There could be multiple attempts by multiple groups, of course. If there were 100 such efforts over a period of time, the chance at least one of these would be successful comes in at less than one in over 10,000 at the one chance in two level. At the far more realistic level of one chance in three it would be about one in nearly 35 million. If there were 1,000 dedicated attempts, presumably over several decades, the chance of success would be worse than one in a thousand at the 50/50 level and one in nearly 3.5 million at the one in three level. Of course, attempts in the hundreds are scarcely realistic, though one might be able to envision a dozen or so.

Improbable events, even highly improbable ones, do sometimes take place. But although any event that is improbable is, at the same time and by definition, possible, it is a fundamental fallacy to conclude that, because improbable events do occasionally occur, an improbable event should somehow be taken to be likely. Estimating just how "difficult" or "not impossible" the atomic terrorist's task would be is—while imperfect—a necessary step in formulating proper policy. ■

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APPENDIX A

The atomic terrorist's task in the most likely scenario

1 An inadequately secured source of adequate quantities of highly enriched uranium (HEU) must be found.

2 The area must be entered while avoiding detection by local police and locals wary of strangers.

3 Several insiders who seem to know what they are doing must be corrupted.

4 All the insiders must remain loyal throughout the long process of planning and executing the heist, and there must be no consequential leaks.

5 The insiders must successfully seize and transfer the HEU, the transferred HEU must not be a scam or part of a sting, and it must not be of inadequate quality due to insider incompetence.

6 The HEU must be transported across the country over unfamiliar turf while its possessors are being pursued.

7 To get the HEU across one or more international borders, smugglers must be employed, and they must remain loyal despite, potentially, the temptations of massive reward money even as no consequential suspicion is generated in other smugglers using the same routes who may be interested in the same money.

8 A machine shop must be set up in an obscure area with imported, sophisticated equipment without anyone becoming suspicious.

9 A team of highly skilled scientists and technicians must be assembled, and during production all members of the team must remain absolutely loyal to the cause and develop no misgivings or severe interpersonal or financial conflicts.

10 The complete team must be transported to the machine shop, probably from several countries, without suspicion and without consequential leaks from relatives, friends, and colleagues about the missing.

11 The team must have precise technical blueprints to work from (not general sketches) and must be able to modify these appropriately for the precise purpose at hand over months (or even years) of labor, and without being able to test.

12 Nothing significant must go wrong during the long process of manufacture and assembly of the improvised nuclear device (IND).

13 There must be no inadvertent leaks from the team.

14 Local and international police, on high (even desperate) alert, must not be able to detect the project using traditional policing methods as well as the most advanced technical detection equipment.

15 No criminal gangs or other locals must sense that something out of the ordinary is going on in the machine shop with the constant coming and going of nonlocal people.

16 The IND, weighing in a ton or more, must be smuggled without detection out of the machine shop to an international border.

17 The IND must be transported to the target country either by trusting the commercial process, filled with people on the alert for cargo of this sort, or by clandestine means, which requires trusting corrupt coconspirators who may also know about any reward money.

18 A team of completely loyal and technically accomplished coconspirators must be assembled within, or infiltrated into, the target country.

19 The IND must successfully enter the target country and be received by the in-country coconspirators.

20 A detonation team must transport the IND to the target place and set it off without anybody noticing and interfering, and the untested and much-traveled IND must not prove to be a dud.