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THE BIOTERRORISM THREAT: TECHNOLOGICAL AND POLITICAL CONSIDERATIONS

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Bioterrorism—along with biowarfare, from which it may not always be distinguishable in practice—will be a feature of the strategic landscape in the 21st century and is high on the US national security agenda. Bioterrorism poses a potential threat to the US population, agriculture, interests, friends and allies, and military forces (asymmetric threats). Yet these possibilities have not been widely pursued or realized by terrorists. The perceived threat is far worse than anything experienced to date, and is largely technologically driven.

There is no consensus on the current threat, but threat perceptions appear to be driven by:

- Aum Shinrikyo's chemical attack on the Tokyo subway, which is seen to have broken a taboo on weapons of mass destruction (WMD), or nuclear, biological and chemical (NBC), terrorism;
- Aum's multiple, failed efforts prior to and after the Tokyo attack to disseminate biological agents—anthrax and botulinum toxin;
- interest in biological agents expressed by US militias, white supremacists and others, an interest punctuated by scores of recent anthrax hoaxes across the United States;
- the impact of media—from news reporting to novels and movies; and
- the prospective impact of the biotechnology revolution in terms of increasing the threat and the potential horror of any attacks.

The meaning of these events and developments are not wholly obvious or clear. Their interpretations reflect, and will undoubtedly affect, a US sense of vulnerability to terrorism, in particular to domestic terrorism, which originated with the World Trade Center and, especially, the Oklahoma City bombings.

There is a sense, discernible in the reaction to recent events, that bioterrorism is something new under the sun. The bioterrorism threat is not new, although it is not well understood or characterized. In order to understand the future threat, it is imperative to understand better the past and the present. Yet it must be recognized that today's threat assessments will have to speculate on how the threat may evolve in a revolutionary period—at the outset of a biotechnology revolution with the prospect of more profound changes than that in physics in the first half of the last century.

Is the past prologue? Or will technological advances change the threat picture entirely? From a technological perspective, the threat seems grave, and inevitably getting graver. Insights into technological trends and possibilities are important. However, they alone are insufficient to gauge the threat. The historical record of terrorism, and of bioterrorism, reveals grounds for concern, but suggests a more limited instrument, one that has not been particularly effective or appealing. Is this merely the play of fortune? Or does this have to do with the motivations, and to

the strategic (and tactical) personalities of terrorists? What are some of the insights or lessons that the record offers?

Any bioterrorism that may occur is likely to be apocalyptic. Even some observers who recognize that bioterrorism will not be apocalyptic still speak of death tolls in the thousands, tens of thousands and hundreds of thousands (if not millions) and devastating impacts on states and societies. This is the sense behind such terms as "superterrorism" or "grand terrorism" or "catastrophic terrorism."[1] In contrast, the bioterrorism experienced to date, with far more limited effects, raises questions about this characterization and future threat projections based upon it. It must be recalled that the Tokyo attack, the only significant act of NBC terrorism to date, killed twelve people. This loss is tragic, but it is well within the bounds of conventional terrorism in its destructiveness.

The historical experience and growing analytical base on bioterrorism incidents suggests that lower consequence events—hoaxes and conspiracies, along with amateurish, inconsequential and even deadly (but low-casualty) attacks, including poisonings—have largely defined the real-world threat to date and may do so for the foreseeable future.

This real-world context reveals that the utility of the term weapons of mass destruction is distortive and of limited utility. So-called WMD are not monolithic. The effects of nuclear, biological and chemical weapons, and of the various types of each, differ widely and are not necessarily massively destructive. The effects of biological terrorism depend on whether salmonella or anthrax or smallpox is used, along with the sophistication of the attacker and a host of other factors. Bioterrorism will not necessarily produce greater effects than the traditional high explosives historically preferred by terrorist groups. Of course, particularly at the high-impact end, it is technically possible to go well beyond these effects. That prospect has to be addressed.

The intent of the terrorism can also be a significant factor, i.e., whether an act is designed to produce mass destruction or some lesser objectives. In this respect, plans to use biological agents to assassinate individuals, which are evident in a good deal (but by no means all) of the threats from racist and religious terrorists, are a case in point. However, raising this issue should remind us that the limited experience with biological and other unconventional terrorism makes it difficult to address terrorists' intentions, motivations and other behavioral issues in this context with authority.

With these considerations based on the historical record in mind, the limited experience of bioterrorism may be understood (to some degree at least) on the basis of technological and political considerations. Technology has posed barriers or obstacles to bioterrorism, even though terrorists have been able to conduct at least some forms of bioterrorism for probably as long as there have been terrorists. Crude bioterrorism does not really require advanced technologies or specialized equipment.

In any case, the production of biological agents can be undertaken in a small facility, with no readily identifiable distinguishing features or signatures. Few precursor materials are essential,

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[1] See, e.g., Ashton Carter, John Deutch and Philip Zelikow, "Catastrophic Terrorism," *Foreign Affairs*

although growth media are needed to produce significant quantities. Culture can be obtained from commercial houses (although this avenue is coming under better control) or from nature, and relatively small quantities are required. The production and dispersal of an agent such as anthrax would probably not pose challenges that a terrorist group with some technical expertise, specialized scientific knowledge and modest funds could not to some degree meet.

Engineering delivery means can be more difficult. Even the Iraqis had serious problems in developing weapons for combat operations. Biological agents and toxins can be dispersed in the air or in water, but their dispersion and survivability are factors that must be taken into account in ensuring effective dissemination. The problem of the deterioration of the agents prior to and during dissemination is critical in this respect.

As these considerations suggest, there are technology barriers to bioterrorism, particularly at the high-impact end; these barriers are eroding as a result of:

- technology diffusion via the Internet and other means;
- the proliferation of technologies, equipment, agents and materials, most of which are "dual use" with widespread, and legitimate, commercial uses; and
- the collapse of the Soviet Union, which did not only increase the insecurity of nuclear weapons, but also of biological and chemical weapons.

There is evidence of significant erosion of barriers for low-impact attacks, which have minimal requirements in any event. For high-impact bioterrorism, significant barriers remain, especially those involving effective dissemination. Challenges such as aerosolization thwarted *Aum Shinrikyo*. And the requirements for significant bioterrorism include extensive human and material resources, infrastructure, testing, etc. The impact of the biotechnology revolution could change this in the future, but there is no reason to believe that technology change will become the driver of the threats all of a sudden.

With this last point in mind, advances in biotechnology could, in principle, increase the threat. By enhancing the potency or survivability of the agent or toxin, or leading to the creation of entirely new and perhaps more virulent organisms, such advances could have serious consequences. Such advanced technologies would be more difficult to acquire for terrorists or subnational groups, however. Developing or otherwise obtaining exotic pathogens and mastering sophisticated dispersal methods would pose serious and perhaps insoluble problems for most terrorist groups and for individuals that may contemplate bioterrorism.

One aspect of change is worth highlighting. The biotech revolution will create an increasingly large cadre of technically-capable individuals—amongst whom may be some who turn to violence and use their capabilities alone or with like-minded persons in bioterrorism on the model of the Unabomber. This prospect could be deadly, but it is unlikely to be massively destructive.

In a realistic assessment of the threat, political considerations are more important than those centered on technological issues. Politically, terrorists in the last decades have not seen the threat or use of bioweapons to be in their interest. Biological or other unconventional terrorism may be inconsistent with their objectives. The terrorists may also have feared public repulsion and governmental reactions. It is argued that these political barriers are eroding with the use of new,

or postmodern, terrorists.[2] This is surely true, but it is important to recall that these barriers have not disappeared. New terrorists or old, in the future as in the past, most terrorists may not wish to kill large numbers of people indiscriminately because they see it as unnecessary, counterproductive or immoral.[3] These practical, political calculations will have force so long as terrorists are not wholly irrational.

Biological threats are also inconsistent with established terrorist operational patterns. Terrorists remain operationally conservative, although some groups have demonstrated a significant tactical adaptability. Despite immense technological possibilities, terrorists today, as they have in the past, favor guns and bombs, with bombings being the most common actions of terrorists. High-technology weaponry and complex operations increase the chances of failure, and have not generally been appealing to terrorists who have desired predictable and easily controllable effects, and successful actions. Innovations of this sort may also be unappealing insofar as they increase the prospects for detection, due to increased time requirements for obtaining equipment and materials, logistics, training, etc.[4]

If there have been technological, political and operational reasons why the full range of possibilities associated with bioterrorism have not been realized, this may not hold forever. As noted, the erosion of both technological and political barriers to mass destruction terrorism has been put forward (and, in many cases, exaggerated) by observers. But significant acts could occur in the future. The greatest fears of bioterrorism are based on the belief that technology diffusion will increase the technical capabilities of the terrorists, and that the potentially greater access to weapons or agents (as a result of inadequate security in Russia and elsewhere) could reduce technological barriers to bioterrorism —with both prospects making bioterrorism more appealing and likely. These developments are a concern. However, this view assumes technical barriers have been the primary reason terrorists have not engaged in serious bioterrorism to date. This is not the case.

The erosion of political barriers is potentially more significant for the future of the threat.[5] It is difficult to know what, if any, political developments would open the floodgates of significant bioterrorism. Much has been made of emerging new terrorist groups as potential, or even probable, authors of mass destruction. Yet these groups, which already reveal greater lethality, less-clear political motivations, and other elements of the extremism believed a requirement for mass-destruction terrorism demonstrate clearly that old political constraints have eroded without necessarily leading to a wave of bioterrorism or other unconventional terrorism. Yet, to the

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[2] On the new terrorists, particularly on the rise of religious terrorists and amateurs, see Bruce Hoffman, *Inside Terrorism* (London: Victor Golancz, 1998). See also Walter Laqueur, "Postmodern Terrorism," *Foreign Affairs* (September/October 1996); pp. 24-36, and *The New Terrorism: Fanaticism and the Arms of Mass Destruction* (New York and Oxford: Oxford University Press, 1999).

[3] See Brian Jenkins, "Nuclear Terrorism and Its Consequences," *Society/Social Science and Modern Society*, vol. 17 (July/August 1980), p. 7.

[4] See Hoffman, *Responding to Terrorism Across the Technological Spectrum*, US Army War College, Strategic Studies Institute, July 15, 1994; and G. Davidson Smith, "Sources of Terrorist Weaponry and Major Methods of Obtaining Weapons and Techniques," in *Technology and Terrorism*, ed. By Paul Wilkinson (London: Frank Cass, 1993), p. 124.

[5] See Jenkins, "Terrorism in the 1980s," RAND Paper P6564 (Santa Monica, CA: RAND, December 1980), p. 7.

extent that these emerging groups are removed from the promotion of concrete and clear political causes and may pursue such ends as punishment, revenge or apocalyptic visions, the prospects of their turning to bio and other unconventional terrorism increases, but is by no means certain. The greatest threats appear to be posed by religious-based and radical right groups, both domestic and international.

There is also a widespread belief that biological or other NBC terrorism is more likely under state sponsorship.[6] State sponsorship raises, in this context, the issue of bioproliferation, particularly among states accused both of possessing or seeking bioweapons and of supporting terrorism. This has created confusion in the scholarly and policy literature, where the juxtaposition or conflation of these threats has occurred.

In principle, state sponsorship can and does provide terrorists with more resources than they would otherwise have, particularly funding, intelligence and technical expertise. It can, in principle, also remove certain constraints on the terrorists' actions. However, none of these factors indicates that state-sponsored bioterrorism is more likely in the near or medium terms.

The issue of failed or failing states raises concerns in this regard. But most states, including unstable and aggressive regional regimes known to support terrorism, would most likely resist providing biological agents or weapons to terrorist groups, or offering sanctuary to terrorists who were planning or had conducted an act of bioterrorism. States might conclude that bioweapons provided to terrorists constituted an unacceptable danger to themselves, especially if the terrorists were not under their direct control. These states might also fear that any support they might provide, if it became known, would result in intense political pressures and the possibility of isolation or even of large-scale military action directed against them.

In addition to technology diffusion, the rise of new terrorists and the prospect of state sponsorship, the evolution of the bioterrorism threat may be affected by a number of factors, some of which have already been alluded to, including:

- public perceptions of the threat—especially in popular novels and movies;
- public reactions and governmental responses to terrorist hoaxes and other low-impact acts, which will influence whether bioterrorism is seen as an effective instrument or as a death warrant for a terrorist group;
- the evolution of the military threats, including the role of biological weapons in future militaries and asymmetric warfare trends;
- the use of biological weapons in warfare—What will be the impact? reactions? responses? Will bio use create a limited reaction like the Iraqi use of chemicals in the first Gulf War?

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[6] See, for example, Konrad Kellen, "The Potential for Nuclear Terrorism: A Discussion," in *Preventing Nuclear Terrorism: The Report and Papers of the International Task Force on Prevention of Nuclear Terrorism*, ed. by Paul Leventhal and Yonah Alexander (Lexington, MA, and Toronto: LexingtonBooks, D.C. Heath and Company, 1987), p. 118; and Eugene Mastrangelo, "Terrorist Activities by Region," in *Preventing Nuclear Terrorism*, op. cit., pp. 141-142.

- the public debates on biotechnology and other biological issues could also be significant, including:
  - the human and environment impacts of cloning, genetically modified foods, etc., that is, "Frankenstein" issues; and
  - the role of pharmaceuticals in domestic and global economies; and
- the emergence of public movements inspired by anti-technology, anti-capitalism, etc., à la Seattle and Davos, Switzerland.

To the extent that these developments may suggest that bioterrorism will provide increased leverage and impact for terrorists, or provide individuals, groups and perhaps other entities with grievances or other rationales, they could be significant in shaping the future bioterrorism threat.

As suggested, the consideration of technological possibilities in the context of historical trends may be valuable in helping to characterize the threat in a realistic fashion, which gives grounds for concern but not panic. Yet it is not possible to be certain whether the past is prologue or whether the future will be unlike the past. Many elements of the future threat are cloudy and need to be better analyzed. Among those elements are the following:

First, the agents that may be utilized by terrorists, especially in the longer term, are unknown. There are a number of agents of concern, including anthrax, but they may not be the choice of terrorists. Smallpox is a particularly worrisome threat with far greater consequences. Although the old Soviet program reportedly produced smallpox as a strategic weapon directed against the US homeland, it is not clear whether terrorists would be interested in this deadly virus. In similar fashion, truly apocalyptic plagues and designer bugs have uncertain futures, less for technological than political reasons. On the other hand, toxins are attractive for terrorists, and production methods are changing that make them more accessible.

Second, the manner in which terrorists may use biological agents or weapons (as also is the case with states) is unknown. For states and terrorists, biological weapons may be seen as an instrument to be used for:

- revenge and punishment;
- asymmetric warfare—to undermine coalitions, disrupt power projection forces, etc.; or
- perhaps other, new objectives.

More traditional motivations, from political objectives to extortion to publicity may, in principle, be served by bioterrorism. However, the increased risks; the unpredictability of the effect, which is likely to be less than expected; and the presence of a lag time of from hours to weeks for many classical agents before any significant effects appear raise questions about the utility of bioterrorism in the pursuit of traditional ends. If bioterrorism were to be used in this way, looking at the relationships between ends and means suggests that limited threats for limited objectives are behind the most plausible scenarios. Indeed, it is difficult to develop credible scenarios for terrorists undertaking mass destruction bioterrorism for clear political or monetary gain. What would be their demands? How could they assure a state or states that submitting to their demands will end the threat? What are the prospects of a state or states submitting to bioextortion? Could this danger ever be acceptable to a threatened state? What alternatives would the state have?

Finally, the role of bioterrorism compared to conventional and other unconventional terrorist threats is unclear. It might be expected that terrorists will in most cases forego NBC attacks. Despite the low probability, if a capable terrorist organization decides to undertake a significant act of NBC terrorism, or new terrorist organizations emerge that are dedicated to such terrorism, what route might they be expected to take? If they move to NBC terrorism, will it be bioterrorism? If dramatic, destructive results are desired by terrorists, they might in theory find nuclear terrorism more appealing than biological or chemical terrorism. The potential advantages are probably outweighed by the disadvantages for a terrorist, however, particularly the technological difficulties posed by a nuclear act.

Chemical and biological weapons are more accessible and may more likely be used by terrorists than nuclear materials or weapons (but we must not exaggerate the ease by which chemical-biological terrorism can be undertaken). Of the two, chemicals may be preferred. Observers have noted the potential advantages of biological terrorism from a terrorist perspective, albeit unconvincingly. A major act of biological terrorism is not easily achieved by terrorists and may not be seen as ideal from their perspective. Save for toxins, which have characteristics similar to chemicals, biological weapons may be seen as too challenging to terrorists on technological grounds. Moreover, they have properties, in particular their risks and their delayed and highly uncertain impact, that may make them unattractive to terrorists' operations unless those operations were to change dramatically in the future.

Bioterrorism is a real threat for the 21st century, albeit one that is not fully understood. The threat is perhaps in the "too difficult" box, but it should not be either hyped or downplayed for this reason. Perceptions of the threat are being shaped, to a large extent, by academics, policy makers and analysts, the media and others, rather than by terrorist behavior. Increased awareness of this horrible prospect is to the good. Unfortunately, this influence has been negative as well as positive, and can have an impact on responses. There is a need to find a balance between overreacting and inaction; this will be critical in defining and implementing sustainable responses based on real threats. Any responses will be heavily influenced by biotech developments, probably far more than the threat itself.