RETHINKING BIO-CHEMICAL DANGERS

by Henry Sokolski

Well before the Aum Shinrikyo sarin gas subway attack of 1995, the Defense Department was forced to consider the implications of a biological weapons attack directed against the Pentagon.[1] It was not a real threat, but rather a scenario posed by a leading biological weapons expert to a meeting of senior Defense Department officials shortly after President Bush had committed U.S. forces to defend Saudi Arabia. What, this expert asked, was the Defense Department doing to protect against the possibility of an anthrax letter-bomb being sent to the Pentagon by Saddam Hussein? All the officials at the meeting shifted uncomfortably in their chairs. There was some discussion of the difficulty of searching over 25,000 briefcases and purses carried into the building daily. This was followed by a somewhat lengthier discussion about the need to be in touch with the Centers for Disease Control and the local fire department.

The awkwardness continued until one of the junior officials present was asked what could be done. Not much, was his answer. However, he was not sure that there was much of a threat. An anthrax letter-bomb might kill officials in the Pentagon, but was unlikely to paralyze U.S. armed forces (most of whom were housed elsewhere). And in any case, he explained, such an attack would solve the White House's key problem, which was to win public support for a ground attack on Iraq. The only real worry was that Saddam could not be counted on to be so stupid. With this, the meeting ended and no action was taken.

Although Operation Desert Shield is now nearly a decade past, the relevance of this story could not be more immediate to today's popular assessment of the chemical and biological weapons threat and what our government should do. In fact, since Desert Storm and the Aum Shinrikyo attack, Americans' concern about these threats has only grown. The essential difference now, however, is

[1]This essay originally appeared in *Orbis*, Spring 2000, and arose from the Foreign Policy Research Institute conference "America the Vulnerable: Three Threats and What to Do about Them," Philadelphia, Pa., Oct. 7–8, 1999.

that unlike the Pentagon of 1990, Washington has reacted with energy.

Thus, in January 1999 the president announced his intention to spend $10 billion on countering terrorism, including biological and chemical threats, for fiscal year 2000. In addition, ten National Guard response units of twenty-two men each have been created along with fifty smaller state guard units to help local authorities respond to chemical and biological attacks. Then the secretary of defense announced in the fall of 1999 that the U.S. Preparedness Command would be in charge of Homeland Defense.

The presumption in all this seems to be that what happened in Japan in 1995 is likely to happen here, and on a much grander scale. Consider the comments of high officials and the press. ABC-TV's *Nightline*, in one of the most lavish efforts to cover the chemical and biological threat, ran a week-long series in which experts commented on a hypothetical anthrax terrorist attack against the New York subway system. The pace and tragedy of the scenario are driven by the central frightening fact that most of the anthrax spread in the attack is presumed to have been inhaled on day one. Given that anthrax has an incubation period of only three to seven days, the scenario did not allow public officials to get help to those exposed. By the end of the seven-day scenario, 65,000 New Yorkers had become ill and 80 percent were expected to die.[2]

A Future Unlike Our Past?

Although gruesome, this coverage hardly seems like hyperbole when compared to the views of other top U.S. officials. Perhaps the most famous of these was the one offered by the secretary of defense on ABC's *This Week*. Holding a five-pound Domino sugar bag, the secretary explained how little anthrax would be needed to kill half the residents of Washington. In a subsequent, syndicated

[2]In fact, there is a vaccine for anthrax. If diagnosed early, anthrax victims can be treated with antibiotics for several weeks to keep the anthrax from taking over and to allow the vaccine to kick in. See Donald A. Henderson, "Dangerous Fictions about Bioterrorism," *Washington Post*, Nov. 8, 1999. Dr. Henderson, a public health physician and director of the Johns Hopkins Center for Civilian Biodefense Studies, points out that the critical period "would extend far longer than the seven days portrayed" along with the "window of opportunity for carrying out life-saving medical interventions beyond a week." *Nightline*'s story, however, ended at day seven, "implying—incorrectly—that no further interventions would be useful." As Dr. Henderson notes, one of the largest anthrax outbreaks in recent history took place in Sverdlovsk, Russia, in 1979, and some infections occurred as early as two days after the anthrax's release and some as late as 47 days later.

column, the secretary cited the Aum Shinrikyo attack of 1995 (which killed twelve) and declared that "the race is on between our preparations [against domestic chemical or biological attacks] and those of our adversaries. . . . There is not a moment to lose."[3] And then there was the impetus for President Clinton's first briefing on bioterrorism—a novel called *The Cobra Event*. Written to scare, the novel describes an act of domestic terrorism in which a disease that involves self-cannibalism is hatched in New York.[4] The president wanted to know from the Central Intelligence Agency: was this plausible?

Not so long as our future is unlike our past. As David C. Rapoport, editor of *Terrorism and Political Violence*, documents in his path-breaking analysis, "Terrorism and Weapons of the Apocalypse," the threat of biological and chemical domestic terrorism has so far been fairly remote. In fact, the CIA reports that between 1960 and 1980 there were 40,000 international terror incidents. Of these, twenty-two, or one in 2,000, had chemical or biological elements.

Going back a full century, the relative numbers are even lower. Since 1900 there have only been seventy-one known terrorist acts worldwide involving the use of chemical or biological agents. Of the 123 fatalities these attacks caused, only one was American—a California school superintendent targeted by a Symbionese Liberation Army cyanide-laced bullet. Of the 3,774 nonfatal injuries these attacks caused, no more than 784 involved Americans. Almost all of these—751—were the result of a salmonella food poisoning incident perpetrated in 1985 by an Oregon-based religious sect. As for biological attacks worldwide, seventy have occurred in the last century, causing nine deaths, but only eighteen of these seventy attacks were made by terrorists.[5]

These are not large numbers. What is perhaps worrisome (and largely a function of the media's recent coverage and so many

[3]See William S. Cohen, "Preparing for a Grave New World," *Washington Post*, July 26, 1999. For an earlier similar view, see William S. Cohen, "In the Age of Terror Weapons," *Washington Post*, Nov. 26, 1997.

[4]See Richard Preston, *The Cobra Event* (New York: Random House, 1997) and the author's own review of his book (http://www.amazon.com/exec/obidos/ts/book-reviews), in which he explains, "The story of the bioterror event in New York City is fiction. But a lot of the background is totally real. The disease, which involves self-cannibalism, is real, though in reality it is not contagious."

[5]See Jonathan B. Tucker and Amy Sands, "An Unlikely Threat," *Bulletin of the Atomic Scientists*, July/Aug. 1999, pp. 46–52; David Rapoport, "Terrorism and Weapons of the Apocalypse," *National Security Studies Quarterly*, Summer 1999, p. 59; and Seth Carus, *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents in the Twentieth Century* (Washington, D.C.: Center for Counterproliferation Research, July 1999).

officials' pronouncements) is that forty-five of the seventy attacks reported this century occurred within the last ten years.[6] Yet, so far, none has been very effective. The increased number of incidents, however, does make it both politically and substantively imprudent to dismiss such threats.

Downside Risks

That said, how much should one make of the threats? There are, after all, risks not only in underestimating the chemical and biological domestic terrorist threat, but in overestimating it as well. So far, such downside risks have received scant attention. The most prominent of these include:

- Raising public consciousness about the possible threat in a manner that emboldens and empowers criminals and terrorists to attempt precisely what the government and public want to avoid.
- Reassuring the public about the preparedness of government such that any government shortcoming is likely to be magnified to politically fatal levels (i.e., to levels perhaps desired by the perpetrators).
- Preemptively undermining significant U.S. civil liberties in the name of enhanced homeland defense by encouraging overreaction on the part of law enforcement agencies. What we do not need are scenarios similar to Ruby Ridge and Waco, Texas, that inspire chemical or biological "Oklahoma City" incidents in retaliation.
- Expanding the role of the U.S. military (and of martial law) into the domestic realms of law enforcement by making the response to domestic chemical and biological attacks a core military mission.
- Distracting the military from chemical, biological, and conventional threats to U.S. bases and embassies overseas.
- Encouraging an "America first" siege mentality and a retreat from foreign commitments critical to our nation's security.

Most of these risks, of course, are far from immediate. The White House and Defense Department are sensitive to military intrusions into domestic law enforcement and are just as concerned about

[6]For one of the only quantitative analyses of the relationships among press coverage, terrorism involving weapons of mass destruction, and the threat perceptions of the U.S. government and public, see Martha Crenshaw, "Threat Perception in Democracies: 'WMD' Terrorism in the U.S. Policy Debate," presented before the 22nd Annual Scientific Meeting of the International Society for Political Psychology, Amsterdam, July 18–21, 1999.

preserving the fullest enjoyment of civil liberties.

This, however, could change. Some of the nation's most respected security experts, after all, want to make responding to domestic terrorism a high-priority mission for our military. Others are just as convinced that it is critical to "resolve the tension" between judicial rules of due-process discovery with the demands of national security and the need to protect intelligence sources and methods.[7]

The point is that ultimately the downside risks listed are at least as likely as the domestic biological and chemical terrorism threats that might generate them. Either set of threats, if realized, could jeopardize our way of life. If we are serious about one, then we need to be serious about the other. The question is how? Part of the difficulty in balancing these concerns is that it is easier to speculate on what terrorists may be able to do and design programs to mitigate such threats than it is to know when and why to *stop* speculating and designing. Focusing on two broad considerations, however, should help. The first of these is determining just how practical current chemical and biological agents are for military and terrorist use. The second is identifying what defensive strengths the United States can exploit to mitigate these threats.

Technical Considerations

About traditional chemical agents, history suggests that in military settings they injure far more than they kill. This makes sense if only because it takes massive amounts of chemical agent to produce military casualties with any reliability, and maximizing their military dissemination is no easy task. If the agent is released too high in the atmosphere, it will be too diluted to do much harm when it comes to the ground. If it is released too close to the ground, the lethal area of the attack will be small. Wind can blow agents off their intended path, and sun and heat can evaporate volatile ones such as sarin.[8]

If one is aiming to kill massive numbers of troops or residents with chemicals, then quantity matters. In the case of a terrorist sarin attack against Washington, D.C., terrorists would need more

[7]See, e.g., Richard A. Falkenrath, Robert D. Newman, and Bradley A. Thayer, *America's Achilles Heel: Nuclear, Biological, and Chemical Terrorism and Covert Attack* (Cambridge, Mass.: MIT Press, 1998), pp. 261–336; and Ashton B. Carter, John M. Deutch, and Philip D. Zelikow, *Catastrophic Terrorism: Elements of a National Policy* (Stanford, Calif.: Stanford-Harvard Preventive Defense Project, Oct. 1998), pp. 6–10.

[8]See Brian Chow et al., *Air Force Operations in a Chemical and Biological Environment*, DB-189/1-AF (Santa Monica, Calif.: RAND, 1998), pp. 12–37.

than a vial or a tall building to deliver much of a punch. In fact, the Congressional Office of Technology Assessment estimated that terrorists would need a ton of sarin disseminated by airplane under ideal weather conditions to produce 3,000 to 8,000 deaths. Under breezy conditions, the same attack might only kill 300 to 800. With nerve gas, which is much more lethal, the amount needed to produce heavy casualties among an unprotected population in an open area of one kilometer square would still be measured in tons.[9]

Given these facts, it is not surprising that, even in total wars, chemical weapons have not been the absolute weapon. On the Western Front in World War I it took an average of just over a ton of agent to kill a single soldier. Only two or three percent of those exposed to gas on the Western Front actually died, and gas was responsible for no more than 5 percent of the war's total casualties. In Iraq's war against Iran, the story was much the same. Of the 27,000 Iranians reported to have been exposed to Iraqi gas through March 1987, only 265 died. Over the entire war, Iraqi chemical weapons killed 5,000 Iranians. This constituted less than one percent of the 600,000 Iranians who died from all causes during the war.[10]

These facts should not be used to denigrate any loss of life or suffering caused by chemical weapons. They are, however, directly relevant to how seriously we should view the chemical threat. First, they help to explain why traditional chemical agents have been used so rarely even in war. It is not merely that it takes so much agent to kill. It is that any military hoping to injure the enemy or force him into donning protective gear must be able to defend against possible chemical counterstrikes.

Having anything less than this is an invitation to trouble unless (1) one's opponent lacks nuclear, chemical, or biological weapons to strike back or sufficient passive protection to survive an attack; or (2) one is fighting a desperate war of attrition along a relatively fixed front and requires a tactical means to support an offensive breakthrough or to defend against one. On several occasions, these military criteria have been met, and in these instances chemical agents have been used. At no time, however, has such use produced strategic results.

[9]See U.S. Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks* (Washington, D.C.: U.S. Government Printing Office, Aug. 1993), pp. 52–56.

[10]For more complete reviews of this historical data, see John and Karl Mueller, "Sanctions of Mass Destruction," *Foreign Affairs*, May/June 1999, pp. 46–48; and Rapoport, "Terrorism and Weapons of the Apocalypse," pp. 52–55.

This may be different in the American case, however, where the toleration for casualties within the military (if not the public) is still quite low. Certainly, to the extent that the United States depends on access to overseas ports, airfields, and command centers to project force, protecting these assets against chemical and biological attack will be critical. The American military and its allies must have enough warning to don protection soon enough to avoid the worst, and since our chemical and biological sensors are quite crude, more needs to be done in this area.[11]

If military use of chemical and biological agents has been historically rare, domestic criminal and terrorist use of them has been rarer still. Part of the reason for that fact is technical and part operational. Technically, dissemination of chemicals to produce massive casualties is difficult, as demonstrated by the Aum Shinrikyo experience. In an attack in Matsumoto, Japan, a year before the famous Tokyo subway strike, things went awry. The intended targets—three judges—failed to receive fatal doses. Instead, wind blew the agent in the wrong direction and killed seven innocents.[12]

Nor are the perpetrators themselves immune. One of the Aum terrorists was overwhelmed by the agent he tried to deliver, after which the group decided to dilute the agent, rendering it less lethal. Also, in the case of the most successful of the subway attacks, the sarin was not optimized for the widest possible dissemination, i.e., as a gas. All twelve of the deaths caused by the attack were due to the victims' direct contact with liquid sarin. Optimizing effectiveness via gas delivery, however, would have increased the risk of killing the carriers. Likewise, more lethal aerosol dispensers and airplanes might have been employed, but that would have also increased the operation's complexity and the likelihood of its early detection by law enforcement officials. Finally, the production of chemical agents runs the risk of killing the producers.

The technical challenges of terrorists using traditional biological agents to produce massive fatalities are no less daunting. Effectively disseminating these agents is particularly difficult

[11]Biological agents are inhaled. Protection against them is a face mask. Chemical agents, on the other hand, can enter the body through the skin as well. As such, a suit covering the entire body must be donned as protection. Inoculations and vaccines are also available for a variety of agents. However, given the inability to anticipate what agent might be used, protective gear is the first and main line of defense.

[12]See Senate Committee on Governmental Affairs, *Global Proliferation of Weapons of Mass Destruction, Part I, Hearings before the Subcommittee on Investigations*, 104th Cong., 1st sess., 1995, pp. 15–103; and Rapoport, "Terrorism and Weapons of the Apocalypse," pp. 56–58.

since traditional biological agents are lethal only if inhaled, and particles larger than ten microns are likely to be blocked before they reach the lungs. On the other hand, agent particles approaching one micron are likely to be exhaled and so will not remain in the lungs. Operationally, particles sized between five and ten microns are optimal.

Spreading biological agent in particles of that precise size, however, is difficult. Indeed, the Federal Bureau of Investigation has yet to find a terrorist organization that has built an effective delivery system for mass-casualty biological agents; the only organizations that have done so are states. But dispersal of correctly sized biological particles still does not guarantee an effective attack. Sunlight kills or denatures most biological agents (making nighttime dispersal imperative), and wind patterns and humidity matter. An anthrax attack under optimal conditions, for example, would be at least a thousand times more lethal than one made during a sunny day in light winds.[13]

Operational Issues

For soldiers and terrorists alike, these facts have operational consequences. First, biological and chemical agents would be most attractive to desperate nations and military commanders anxious to threaten opposing expeditionary forces and their use of local ports or airfields, or to test an invading nation's political will to continue operations. Secondly, while traditional biological agents would be potentially most effective in killing enemy forces, their delayed effect would not be anywhere near as telling as chemical agents in disrupting ongoing military operations. Thirdly, given the volatility of many chemical agents and the uncertainties associated with biological agent dissemination and their delayed and varied incubation periods, a military decision to use such agents would be complicated. At a minimum, it might turn as much on an assessment of these agents' likely physical impact as their impact on the enemy's will to continue to fight or to escalate the conflict.

As for terrorist use of traditional agents, the technical facts noted above would make their use to inflict massive casualties even less likely. First, the difficulties of acquiring and deploying chemical and biological agents and their poor past performance as compared to high explosives would weigh heavily against their

[13]On these points, see Tucker and Sands, "An Unlikely Threat," p. 51; and Chow et al., *Air Force Operations*, pp. 27–37.

initial selection. Secondly, given these difficulties (particularly with biological agents), state sponsorship or assistance would seem useful. Osama bin Laden may not have had a direct link to the Khartoum pharmaceutical plant the United States bombed in 1998, but if he wanted chemical agents, he had a clear interest in seeking Sudanese help. The problem with asking for such assistance (as bin Laden and the Sudanese learned) is that it increases the risks of being discovered and targeted.

Thirdly, foreign entities seeking asymmetric advantage in hopes of persuading the United States to withdraw from their part of the world would probably want to avoid the complications of using chemical or biological agents on American soil. As the recent arrest of the Algerian Ahmed Ressam in Washington State clearly demonstrates, merely attempting an attack with conventional explosives is risky enough.[14] Indeed, mounting terrorist operations with chemical or biological agents would only increase the likelihood that U.S. authorities might discover the affair and disrupt it or retaliate. Finally, the more indiscriminate and identifiable a foreign terrorist attack is, the more likely would be an American overseas counterstrike.

Emerging Agents

All of the above observations pertain to the use of traditional chemical and biological agents to produce massive casualties. To date, most analyses have focused on the most horrific domestic terrorist scenarios. Two new developments, however, suggest that greater attention should be paid to how the United States might be threatened by more discriminate military agent attacks overseas. The first is Russia's development in the late 1980s and early 1990s of a far more lethal and persistent family of binary chemical substances known as *Novichok* (Russian for "newcomer") agents. The second is the possible development of a new class of biological agents known as bioregulators.

The earliest information on Russia's *Novichok* chemical weapons program came just prior to Moscow's signing of the Chemical Weapons Convention (CWC) from two Russian chemists, Vil Mirzayanov and Lev Fedorov.[15] In the late 1980s and

[14]See Vernon Loeb and Steven Perlstein, "U.S. Puts Borders on High Alert," *Washington Post*, Dec. 19, 1999.

[15]See "Mirzayanov, Fedorov Detail Russian CW Production," from *Novoye Vremya*, Oct. 27, 1992; and "Mirzayanov, Fedorov Article on CW 'War Against Environment,'" from *Nezavisimaya Gazeta*, Oct. 24, 1992, both in Joint Publication Research Service, Commonwealth of Independent States (JPRS-TAC-92-033), Nov. 14, 1992, pp. 44–60. See also Vil Mirzayanov, "Free to Develop Chemical Weapons," *Wall Street Journal*, May 25, 1994.

early 1990s, Russia produced several new agents that were made of chemicals not controlled by the CWC. These agents, referenced by a variety of code names (including Substance 33, A-230, A-232, A-234, Novichok-5, and Novichok-7), are geared for the deployment of binaries, that is, munitions using two agents that are benign when kept separate, but lethal when mixed.

Indeed, they were extremely lethal—at least as toxic and persistent as the most lethal nerve agent, VX, and some are reported to be ten times as toxic. At the same time, they are far more difficult to detect and far easier to manufacture covertly using common chemicals and relatively simple pesticide factories. In addition, unlike VX, which can be defeated quickly with injectable antidotes, Novichok agents are at least as resistant to treatment as Soman.[16]

As of late 1993, Mirzayanov believed that Russia had only produced a few tens of tons of *Novichok* agents for experimental use. Still, there is cause for concern because *Novichok* agents are made of benign industrial and agricultural chemicals and can be made quickly in quantity. There is far less need to produce and stockpile vast quantities of agent or controlled precursors in advance. In addition, despite several defectors' public revelations, the Russian government has never formally admitted developing these agents, and Russian expert opinion remains disturbingly divided over the utility of retaining chemical weapons. Many Russian military experts see chemical agents as yesterday's weapon, but others believe that chemical weapons, especially the new *Novichok* agents, are a needed additional deterrent. What is more, there is reason to fear that Russia might export its *Novichok* data to its traditional clients in Libya, Syria, Iran, or Iraq.[17]

One thing is certain. Given their relative ease of manufacture for chemical-producing nations and these agents' persistence, novelty, and lethality, the *Novichok* family of chemical weapons would be much more attractive for a military to use than traditional agents. At the very least, current chemical detector devices are unlikely to be set off by their use. This alone could prove to be fatal. If delivery were accomplished covertly with special forces,

[16]See Center for Security Policy, "Russia's Covert Chemical Weapons Program," Decision Brief no. 97-D19, Feb. 4, 1997; Vil S. Mirzayanov, "Dismantling the Soviet/Russian Chemical Weapons Complex: An Insider's View," in *Chemical Weapons Disarmament in Russia: Problems and Prospects*, Amy E. Smithson et al., report no. 17 (Washington, D.C.: Henry L. Stimson Center, Oct. 1995), pp. 23–26; and Igor Khripunov and Derek Averre, "Russia's CBW Closet Poses Ongoing Threat," *Jane's Intelligence Review*, May 1999, pp. 20–23.

[17]See Khripunov and Averre, "Russia's CBW Closet."

there might not be any warning at all and targeted troops would be unable to don protective gear before lethal exposure. Also, given these agents' persistence and lethality, far less would be needed to accomplish any given mission.

More remote than *Novichok* agents, but still worrisome, is the prospect that incapacitants known as bioregulators might be developed in a form that could be weaponized. Bioregulators are present in our bodies in small amounts. They determine hormone release, control of body temperature, sleep, mood, consciousness, and emotions. Using the latest recombinant-DNA techniques, scientists might modify bioregulators to enhance their potency and effect. So far, the key obstacle to weaponizing such agents has been dissemination. In one of its last reports, the Congressional Office of Technology Assessment reported that although the small peptide hormone ADH (antidiuretic hormone) had been introduced into the blood stream with a nasal aerosol, similar attempts to do so with insulin failed because of the molecule's large size.[18]

Assuming further research overcomes these problems, such bioregulator agents would be militarily attractive for three reasons: their novelty would almost guarantee their ability to evade current biological agent detectors; they would, unlike other biological agents, have immediate effects and thus could be used to disrupt military operations at key ports, airfields, and command centers; and they could function without losing the key advantage of biological agents, which is their potency as compared to chemical agents.[19]

What We Can Do at Home

Given their rarity and complexity, worrying about imminent use of bioregulators or *Novichok* agents by terrorists would be a mistake. However, given all the attention chemical and biological terrorism has received, the possible use of traditional agents by criminals or terrorists, if only to cause panic through minor attacks, cannot be dismissed.

[18]See U.S. Congress, Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction*, OTA-BP-115 (Washington, D.C.: U.S. Government Printing Office, Dec. 1993), pp. 116–17.

[19]There is good reason to believe that the obstacles to weaponizing bioregulators may fall in the next five to ten years. For a projection of what biotechnology has in store regarding agent development, see House Committee on Government Reform, Subcommittee on National Security, Veterans Affairs, and International Relations, "Assessing the Threat of Bioterrorism," testimony of Dr. Raymond Zilinskas, senior scientist at the Center for Nonproliferation Studies at the Monterey Institute of International Studies, Oct. 20, 1999 (http://www.cns.miis.edu/pubs/reports/zilin.htm).

Fortunately, the United States has considerable resources already in place to address such threats. As Virginia governor James S. Gilmore II, chairman of a presidential terrorism commission, recently explained, "We do not need to create a new mechanism to deal with [chemical and biological terrorism]. . . . We simply need to build on what we have."[20] All told, there are 32,000 fire departments, 8,000 emergency medical services, and 17,000 law-enforcement agencies in the United States, constituting a force of over 2 million first-responders. A good number of fire departments located in industrial areas are already trained to deal with hazardous chemicals. With additional training and equipment, chemical agents could be addressed by these and other departments merely as additional hazardous materials.[21]

As for dealing with domestic biological terrorism, the United States is blessed with a massive health-care system. The country spends nearly four times as much on its public health and medical system as it does on its entire military. The government plans to spend nearly $400 million conducting research on all aspects of chemical and biological weapons defense, but the budget of the National Institutes of Health alone approaches $20 billion. Factor in the fire-fighting services and police, and it is clear that these civilian institutions (and the Centers for Disease Control) are the ones best positioned to respond to domestic terrorism.

Indeed, relying more heavily on these institutions than on the military has several advantages. First, they are already locally deployed. The newly created Rapid Assessment and Initial Detection (RAID) teams actually are unlikely to detect or respond to terrorist attacks first, and in some cases they will not have much training to pass on. As Jerome Hauer, director of emergency planning in New York City's mayor's office, recently explained, with 40,000 police officers, 15,000 firefighters and emergency medical teams, New York already has the "ninth biggest army in the world." Hauer insists, "I don't need RAID teams because my guys are probably better trained than RAIDs." New York firefighters already deal with more than a thousand hazardous-materials accidents a year.[22]

Secondly, in comparison with what is required of the national health-care system to deal with natural diseases, domestic bioter-

[20]See Chuck McCutcheon, "'Homeland Defense': Mobilizing against Terrorism," *Congressional Quarterly Weekly*, Mar. 6, 1999, pp. 522.

[21]See Ron Laurenzo, "Front Line Is Weak Link in Homeland Defense," *Defense Week*, Mar. 15, 1999, p. 1.

[22]Ibid.

rorism is likely to long remain the lesser-included case. Efforts to improve the health-care system's ability to deal with natural incidents should only improve its ability to cope with terrorist incidents and vice versa. As one expert put it, "Our society's response to a natural versus deliberately caused disease outbreak would differ only after there are clear signs that the disease of concern might be the result of a terrorist or criminal attack." What is critical to treating both is early detection, and there are far more natural disease outbreaks to monitor and report than terrorist acts.[23]

Finally, using civilian institutions avoids the downside risks of relying too much on the military. Not only are civil liberties likely to be safer, but the military's ability to focus on its own self-defense requirements will be improved. As it is, the military needs to concentrate on bringing its chemical and biological protection and decontamination units to bear overseas, where the likelihood of use is highest. Yet none of the newly created Reserve and National Guard RAID units is a part of the active military. Given that the most threatening use of chemical and biological agents against Americans is likely to occur abroad, it is critical that our military focus as much as it can on addressing these dangers.

Also, as argued above, our military cannot simply focus on domestic terrorist threats, which have to do with the possible use of traditional agents, without running even greater military risks overseas. In specific, it must do more to tackle the difficult task of developing detection and protection capabilities (especially against new agents, such as the *Novichok* family) and to stay ahead of whatever other agents hostile biotechnologists might develop.

Rethinking the Thinkable

In its first annual report of December 1999, a congressionally mandated advisory panel on domestic nuclear, chemical, and biological terrorism quietly criticized the government's emphasis on massive worst-case scenarios. "As serious and potentially catastrophic as a domestic terrorist attack might prove," the panel reported, "it is highly unlikely that it could ever completely undermine the national security, much less threaten the survival of the United States as a nation."[24]

[23]Of the $10 billion the federal government will spend combating terrorism next year, something less than 2 percent is earmarked for public health surveillance and reporting. See Zilinskas, "Assessing the Threat."

[24]*See The First Annual Report to the President and the Congress of the Advisory Panel to Assess the Domestic Response Capabilities of the Government for Terrorism Involving Weapons of Mass Destruction*, Dec. 15, 1999, available online from RAND (http://www.rand.org/organization/nsrd/terrpanel).

The panel did believe there was a domestic chemical and biological terrorism threat, but it judged possible attacks against U.S. agriculture, small-scale attacks designed to cause panic, and conventional terrorism to be far more likely than the "lower probability/higher consequence attacks" that are the "focus of current policy and preparedness efforts." In fact, the advisory panel warned that focusing so much on the worst-case scenarios was a mistake.

> The guiding assumption has been that smaller-scale, non-mass-casualty events are a lesser-included contingency that can be addressed adequately by preparations for the higher-end mass casualty attacks. This is by no means axiomatic. . . . By continuing a policy that emphasizes high-end threats, there is a very real danger of failing to optimize state and local response capabilities to deal with the more probable terrorist threats confronting the United States today.[25]

The advisory panel, of course, was not asked to assess the foreign chemical and biological weapons threat. Yet, if it had, it is likely that it would have found that in overemphasizing the domestic threat, our government runs additional risks. These would include paying insufficient attention to the threats posed by possible chemical and biological attacks against U.S. forces and facilities overseas, by conventional terrorism generally, and by nontraditional agents.

The point here is not to dismiss the possibility of any particular chemical or biological threat, but rather to weigh how much attention each one deserves. Assuming we are not foolish enough to demand 100 percent protection against all attacks, our medical system, federal and local governments, and military should be able to ensure against a lasting strategic calamity. The key to success, however, will be the same as it was a decade ago in Desert Shield, which is to avoid focusing on the most horrific scenarios at the expense of preparing for the most likely ones.

[25]Ibid.