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Terrorists, WMD, and the US Army Reserve

CHARLES L. MERCIER, JR.

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"The United States shall give the highest priority to developing capabilities to . . . manage the consequences of nuclear, biological or chemical materials or weapons use by terrorists." [1]

The dissolution of the Soviet Union and the end of the Cold War greatly reduced the risk of a global war. At the same time, leadership--whether among allies or friends--and control--whether of surrogates or beneficiaries--tended to dissipate along with the imminent threat of war. Violent political groups previously held in check by their Cold War masters became free to operate on their own, and ethnic, militia, and nationalist organizations began to attract notice.

Civilian and military organizations are equally interested in identifying likely antagonists, such as states that have declared their opposition to the West, and to the United States in particular; rogue states; nonstate criminal organizations, and terrorist groups. The latter have been around for centuries, advancing the interests of clients and their own organizations. [2] Sponsors often used them during the Cold War as surrogates to reduce the risk of direct confrontation between the superpowers. Client restrictions, including limitations on the types of weapons they would provide, were designed to prevent terrorist activities from escalating out of control.

It should come as no surprise, therefore, that once freed from other Cold War constraints, these groups would also reject limitations on the ways and means appropriate to their strategic ends. The emerging weapons of choice for terrorists appear to be those that can be manufactured readily from commonly available chemicals and contagious pathogens in ordinary surroundings and at low cost, especially compared to the cost of a standing force capable of inflicting comparable damage on state institutions. And because these weapons do not require a sophisticated manufacturing infrastructure, production facilities readily avoid the satellite's gaze. The same applies to delivery means; weapons can be carried to targets by individual terrorists operating anonymously across increasingly open borders. The methods have been identified during the continuing search in Iraq for chemical and biological manufacturing facilities and stockpiles. The model is the suicide bombers who have plagued Israel in recent years.

Knowing that there are those who wish us significant harm and that they have both the ability and the will use weapons of mass destruction to cause that harm, we clearly have a problem. Weapons of mass destruction have been within the technological grasp of terrorist groups for some time; they were not employed until a Japanese religious cult crossed that invisible barrier in March 1995. [3] While the cult's target--the Tokyo subway system--was what a terrorist might call "appropriate," Tokyo was fortunate that the cult's agent was impure and dissemination techniques were primitive. Unfortunately, fanaticism is not synonymous with stupidity, so we can expect the next attack with a weapon of mass destruction to be considerably more deadly.

Can we "jump-start" preparations to deal effectively with the threat and the consequences of such an attack? We can if we take advantage of existing experts and proven techniques; the US military is both equipped and organized to meet that threat outside the country. [4] Consequently, the Department of Defense has been given the task of adapting battlefield force protection and recovery techniques for nuclear, chemical, or biological attacks to procedures that will work domestically. Within the Department of Defense, the Army has been identified as the lead service for planning domestic defense against and recovery from terrorist use of a weapon of mass destruction. Within the Army, the Chemical Corps is the proponent for these plans.

This article describes the danger posed to America by terrorists using weapons of mass destruction, the capabilities of the Army Reserve to mitigate that danger, some inhibitors to the efforts of the Army Reserve, and ways they might be overcome.

Threat Motives and Organizations

Anti-Americanism remains a strong motive for certain groups and organizations to contemplate the use of weapons of mass destruction (WMD) against the United States and its allies. Retired Ambassador Morris Busby, former Counterterrorism Coordinator for the US government, warned that rogue states and subnational groups may now be more inclined than previously to "punish" us with weapons of mass destruction simply for being who we are.[5] Some believe that the use of chemical, biological, or nuclear weapons on American soil is a not matter of "if" but when it will happen. As one Senator bluntly observed, "Americans have every reason to expect a nuclear, biological, or chemical attack before the decade is over." [6]

One source defines terrorists as groups or individuals that conduct "premeditated, politically motivated violence . . . against noncombatant targets . . . usually intended to influence an audience." [7] A month rarely goes by without hearing about a terrorist attack somewhere in the world; after the World Trade Center, Oklahoma City, and the Atlanta Olympics, that world seems to be getting smaller. And as one of member of the Hezbollah noted, "We are not fighting so that the enemy recognizes us and offers us something. We are fighting to wipe out the enemy." [8]

The most successful terrorists have state sponsors who provide resources and a degree of sanctuary. Of the seven nations designated by the United States as state sponsors of terrorism (Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria), Iran remains the most active. But whether terrorists have state sponsorship or not, they generally share two characteristics that should concern us. One is the human aspect of their behavior, involving their motivation and psychology; the other is the technological aspect, involving the destructive means at their disposal.

Although certainly helpful to terrorists, state sponsorship is not essential, and as demonstrated by the Aum Shinrikyo and Timothy McVeigh, terrorism is by no means confined to the Middle East. Narco-terrorists threaten South America in the name of greed while the Armed Islamic Group threatens Algeria in the name of religion. America's right-wing "militias" advocate reducing, if not eliminating, the federal government, while Germany's right-wing neo-Nazis still seek racial purity. Peru has its left-wing Sendero Luminoso (Maoist) and Tupac Amaru Revolutionary Movement (Marxist-Leninist). Russia, once seemingly immune to terrorist violence, has recently encountered ethnic terrorism in its conflict with Chechen separatists.

Diverse though terrorist groups may be, it is possible, based on evidence to date, to draw some distinctions among them based on the relationship between their motivation and their preferred weapons. "Politically motivated terrorist groups have generally not sought to use [chemical or biological] weapons in the past because they are unpredictable, indiscriminate, hard to handle, and might alienate supporters." [9] Conversely, weapons of mass destruction perhaps have more appeal to groups such as Aum Shinrikyo, generally considered to be "religious fanatics," than to political terrorists. True believers in religious groups seem satisfied that their values and motives are derived from their devotion to their deity, leader, or doctrine rather than from aberrant behavior generally classified as "fanaticism." Such beliefs render irrelevant the opinions and moral values of others; while political terrorists like the Red Brigade might hesitate to kill great numbers of civilians for fear of alienating support, those who believe they are fighting for their god will not shrink from killing as many "unbelievers" as possible. By their standards, unbelievers are doomed anyway.

Other terrorists, motivated by ethnic concerns, may fear genocide or may themselves desire to destroy their opponents; either way, they operate with fervor. As with religious terrorists, ethno-terrorists show no hesitation to inflict mass casualties; indeed, it seems often that the greater the death toll in one of their assaults, the higher their achievement. Unfortunately, "there is more ethnic conflict now than ten years ago," [10] and such conflict seldom respects state boundaries, as fighting in Africa, the Balkans, and the Caucasus has demonstrated. Depending on the venue, it can also manifest itself as political terrorism; attacks by Algerian terrorists in France and by Kurdish factions in Germany attest to this pernicious aspect of ethnic strife.

Threat Technologies

All three classes of weapons of mass destruction--nuclear, biological, and chemical--are currently within the technological reach of terrorists. Without state sponsorship, nuclear weapons (fission or fusion type) are probably the

least likely of the three to be used. Conversely, both biological and chemical agents can readily be developed by terrorists; each requires a college-level knowledge of biology or chemistry, less than \$20,000 in supplies, and the forged documents or accomplices needed to obtain "seed" bacteria or precursor chemicals. Each of these means possesses its own special characteristics and threat; each is appropriate in varying degrees to the ends and ways of the group using it.

Nuclear Weapons

With the possible exception of the simplest "gun-type" fission device, considerable technology, infrastructure, and scientific knowledge are required to construct even a primitive nuclear weapon. Furthermore, for obvious reasons, practical tests to determine the reliability of nuclear weapons cannot be conducted clandestinely. Consequently, devices that can disperse radioactive materials over a wide area are much more likely to appeal to terrorists. These devices, usually consisting of a conventional explosive to spread radioactive materials (which need not be of weapons grade) would not necessarily destroy property. Their intent is to kill people and to contaminate terrain for indeterminate periods. In late 1995, a Chechen military commander planted a radiation dispersal device in Moscow's Izmailovsky Park and arranged for its discovery by a Russian news team.[11] It was a statement of capability that sent a loud and clear message to the Kremlin.

Biological Weapons

In a 1966 experiment that proved the ease with which terrorists could contaminate portions of the American populace, government personnel clandestinely released "harmless bacteria" into the New York subway system.[12] The contamination was distributed throughout major portions of the subway system by air turbulence created by the trains themselves. This experiment preceded the Aum Shinrikyo attack on Tokyo's subways by almost 30 years.

The technology for producing biological weapons is available to terrorists now: a US neo-Nazi group (the Order of the Rising Sun) produced 80 pounds of typhoid bacillus in 1972, and in 1984 Paris police raided an apartment rented by the Baader Meinhof gang and found flasks of *Clostridium botulinum* culture.[13] More recently, Japanese police found 160 barrels of peptone (a growth media for bacteria) along with *Clostridium botulinum* when they raided an Aum Shinrikyo compound near Mount Fuji.[14] Tricothecene mycotoxins (e.g., "yellow rain") can be produced simply using a corn meal slurry and the appropriate strain of fungus.

Getting started isn't too difficult. Pathogenic microorganisms can be acquired with relative ease with forged documentation and then cultured in makeshift laboratories into larger quantities; state-sponsored laboratories and production facilities are not necessary for success.[15] Terrorists do not need to match the large-scale production capabilities of state-operated facilities; very small amounts of biological agent would be adequate for a terrorist's purposes. As little as eight grams of *Bacillus anthracis* spores (the anthrax bacillus), properly milled, mixed with dispersal compounds to add volume and prevent clumping, and then optimally dispensed, could inflict heavy casualties over a one square mile area.[16] In fact, without effective medical intervention, inhalation of approximately 8000 spores of *Bacillus anthracis* is fatal in nearly all occurrences.[17] *Bacillus anthracis* has an incubation period of two to seven days; usually its victims show symptoms within 48 hours. Vaccination after the fact (without concurrent antibiotic prophylaxis) is of limited value in cases where incubation has begun.[18] It should be noted, however, that rapid intervention with the appropriate antibiotics can have positive results even if some symptoms have already appeared.[19]

Bacillus anthracis represents an almost ideal pathogenic microorganism for terrorists. It is a bacteria, and therefore is cultivated more easily than a virus such as Ebola. Furthermore, it forms spores possessing incredible durability in the soil, which creates the possibility of long-term contamination of an area. Its incubation period is long enough to allow terrorists to escape undetected, but short enough to prevent effective vaccination of victims already infected. The World Health Organization and the US Congressional Office of Technological Assessment have determined in separate studies that, effectively dispensed, 30 to 50 kilograms of *Bacillus anthracis* could kill up to 100,000 people.[20]

Chemical Weapons

A chemical agent is "a chemical substance that is intended for use in military operations to kill, seriously injure, or

incapacitate people through its physiological effects." [21] Fatal at about .01 milligrams per kilogram of human weight, sarin is extremely potent; [22] if a fatal dose is absorbed, death occurs within about 15 minutes. Although it can be absorbed through the skin, its primary source of entry is inhalation. The death toll in the 1995 Tokyo attack was low because the Aum Shinrikyo scientists made some mistakes in preparing the sarin gas and then did not disseminate it so as to maximize its effects. [23]

A much more deadly means of spreading a volatile chemical agent would be to break glass jars of the substance on the intake vents of a high-rise office building. The intake fans would vaporize the agent and distribute it to the floors supplied by the vents, essentially to a captive group of victims. Air turnover in office buildings is deliberately controlled to reduce energy loss, thus making large complexes inviting targets for terrorist organizations. This is especially true in large buildings with sealed windows; their only source of air is the vents.

Threat Summary

Each type weapon of mass destruction described above can cause casualties that would overwhelm established emergency care capabilities of civilian agencies. If contamination is present, such as from fission, fusion, or dispersion of nuclear materials, things only get worse. Although only persistent chemical agents result in contamination by military definitions, even minute residual amounts of non-vaporized nerve agent are outside acceptable bounds for civilians. Few biological agents cause contamination lasting for more than a few days to a few weeks. *Bacillus anthracis*, however, is a significant exception due to the bacteria's spore-forming characteristic. Contamination will have to be eliminated (chemical decontamination, physical removal, or aging) before civilians will feel safe to resume their normal occupation of the area. Decontamination will have to be significantly more thorough than that required for military operations.

Remembering that terrorists do not have the same high-volume delivery capacity seen in the military, maximum casualties could be inflicted with either chemical or biological agents by two methods. First, at night in a city or its suburbs, *Bacillus anthracis* or sarin could easily be spread over a wide area from a passenger van containing an electric motor crop duster. Such a simple dispersion method could be devastating, since "tests suggest that there is no effective filtration of the aerosol during passage of the air through the walls of a building." [24] Due to the clandestine nature of the dispersion, only the onset of consequences would indicate that we had suffered an attack. The second method is that alluded to above, in which high-density office buildings could be attacked by inserting the sarin gas or *Bacillus anthracis* spores directly into the buildings' air intake vents.

The first type of attack would ensure widespread casualties and, with *Bacillus anthracis*, possible long-term contamination of portions of the city along the route of pathogen dispersal. The second type of attack would insure high casualty rates (with sarin) or high infection rates (with *Bacillus anthracis*). The accompanying mortality rate for anthrax could possibly be moderated, but only with timely administration of antibiotics.

Consequences and Responses

Civilians who survive a terrorist attack with nuclear, biological, or chemical weapons will have the same general needs as survivors of any disaster: medical assistance and search and rescue activities. In addition to those needs, a domestic attack involving weapons of mass destruction will likely require someone to identify and restrict access to hazardous areas; as necessary and where possible, decontamination will be required to rid the area of weapon residue.

Medical Assistance

The first things a civilian population would require in the aftermath of a WMD attack would be medical assistance and information about where to obtain it. [25] The mix of that assistance between immediate and long term will be determined by the type of attack and the weapon used. A well-planned program of medical triage and treatment is therefore the first line of defense in dealing with the threat. Unfortunately, the first indication we may get that there has been a WMD attack is reports of massive casualties.

Chemical attacks would yield almost immediate casualties and probably would not involve persistent agents. Here the appearance of casualties would be something of an immediate "spike," leaving medical personnel with a tremendous

overload but without the specter of additional casualties. There would be no structural damage hindering casualty location and recovery. Medical requirements would be immediate and massive in nature. The probable agent of choice would be non-persistent nerve gas, with immediate casualty management consisting of the administration of atropine and pralidoxime chloride. If neurologic involvement is severe, diazepam may be necessary to reduce convulsions and brain damage; ventilation and suction of airways may also be required.[26]

Due to their lack of equipment and training, civilian targets are much more susceptible to chemical attacks than are their military counterparts. Planning to deal with the consequences should include provision of at least rudimentary training to fire and police departments in how to assist victims of certain kinds of attacks. Inhalation, the most probable route of entry for a nerve agent to a civilian population, requires removal of the victim from the contaminated air and administration of an antidote such as atropine. Liquid contamination, a less probable occurrence than vapor but still possible, requires immediate removal of the agent from the victim's skin and then chemical decontamination if possible. Something as simple as applying flour, wiping it off with wet tissue paper, and then scrubbing the area with soapy water can be effective.[27] Speed of response may well determine success or failure in such cases.

Fission or fusion attacks would be spectacular and accompanied by massive structural damage, making the location and recovery of casualties extremely difficult and dangerous. Common knowledge of the effects of such attacks, and their low probability as a weapon of choice by terrorists, will allow us to confine discussion of nuclear materials to dispersion-type weapons.

Structural damage from a radiation dispersion device would be limited by the size of the conventional explosive, and residual radiation would be the real danger. The downwind hazard zone would fortunately be less than from a fission or fusion device since the radioactive material would not be propelled high into the atmosphere. A special risk is that unless authorities were expecting a radiation dispersal device to be employed, they might think it was a normal conventional explosive until large numbers of civilians began to appear with symptoms of radiation sickness. This delayed awareness would increase casualties since unsuspecting civilians would remain in the contaminated area much longer than if they had known of the danger. Medical requirements would be intensive and long term.

Biological attacks have a potential for producing very large numbers of casualties, in the range of 90-100 percent as a function of the type of pathogen and medical treatment available. The casualty stream seen by medical personnel would be zero from the time of attack until the end of the incubation period for the first victim, depending on the pathogen and, to a degree, on the victim. It would then climb rapidly and peak within a few days for anthrax to perhaps two months for brucellosis.[28] Medical requirements consequently could be overwhelming; they would peak rapidly if the pathogen is not particularly contagious. By the time casualties appeared and we learned there had been a biological weapon attack, it would be too late for vaccination to be effective for victims of the primary exposure. Vaccination would be required, however, if the pathogen was contagious, in order to prevent secondary infection. Furthermore, unless the individual had been vaccinated prior to cessation of antibiotics, spores such as *Bacillus anthracis* could remain dormant during the period of treatment with prophylactics and emerge much later to cause infection.[29] The incubation period of contagious pathogens, coupled with this country's mobile population, could, under severe circumstances, create pandemic conditions.

Search and Rescue

The only WMD incident that would cause severe structural damage would be a fission or fusion device. National Guard troops would usually be appropriate for search and rescue missions since they can be immediately called into state active duty status by the governor. Furthermore, Army National Guard units are trained to prevent riots, looting, and entry into prohibited areas. A significant problem, however, would be the coincident radiation hazard that would be present in, around, and downwind of a blast or dispersion area. Identification of radioactive areas, the severity of the radiation, determination of operational exposure guidance, and maintenance of radiation exposure records would be absolutely essential in such an incident to reduce the likelihood that rescue personnel would themselves become casualties. A difficult decision might be necessary: prohibition of search and rescue in certain highly contaminated areas to allow would-be rescuers to spend their time on activities of greater benefit to the majority of the affected population.

Hazardous Area Identification and Restriction

As far as possible, hazardous area identification and restriction should occur coincident with, if not prior to, search and rescue efforts. Without proper identification and containment, rescuers might not use adequate protective equipment or the risk of spreading contamination could be increased. Nothing is simple, of course, and just as nuclear, biological, and chemical weapons have different effects and different methods of treatment, so do they each require different means of detection.

A special problem is associated with contamination in urban areas: contamination would tend to settle in basements and other low areas, rubble piles, and similar collections of debris. This concentration would extend the period of lethality of chemical and biological agents.[30]

Decontamination

Decontaminating civilians would pose some unusual situations. It is unlikely that terrorists would use persistent chemical agents such as VX, since non-persistent agents such as sarin can cause more widespread casualties. So decontamination of chemical agents, for example, over extensive parts of an urban zone, might be unnecessary. Any contamination resulting from "pooling" of non-persistent agents should be quite localized and consequently fairly easy to decontaminate, both physically and logistically. "Unlikely," however, is not the same as impossible; the possibility of persistent agents in an attack must always be considered during decontamination planning.

Pathogens, with the exception of *Bacillus anthracis*, generally die fairly quickly after dissemination, and would likely no longer be threatening by the time serious decontamination efforts could be organized. Conducting thorough decontamination of an entire area containing *Bacillus anthracis* spores is very difficult, but fortunately is not impossible.

Radioactive residue cannot be decontaminated in the same sense that chemicals and pathogens can. It must be removed, buried, or simply allowed to age until it naturally decays. The latter option is probably not realistic due to the long half-life most potential contaminants possess; plutonium's half-life, for instance, is about 24,000 years. But if radiation can't be neutralized, at least it can be detected more easily than chemicals and much easier than pathogens.

The Army Reserve: Capabilities and Drawbacks

The Department of Defense, and specifically the Army, have been assigned responsibility for responding to terrorist use of weapons of mass destruction in the United States. The term "consequence management" is becoming a shorthand notation for that response. As part of its mission, the military has specifically been tasked to "develop and maintain at least one domestic terrorism rapid response team composed of members of the armed forces and employees of the Department of Defense who are capable of aiding federal, state, and local officials in the detection, neutralization, containment, disassembly, and disposal of weapons of mass destruction containing chemical, biological, or related material." [31] Part of the general and specific responsibilities accruing to the military can be carried out by the US Army Reserve. The following is a preliminary assessment of what that mission entails.

The Army trains to fight and win in an environment that includes the prospects of attacks by chemical and biological weapons. Consequently, the Army is one of the organizations best prepared to assist victims of attacks involving weapons of mass destruction. Army Reserve units have the organization, the training, and some of the equipment to provide such support, and the Army Reserve has the mission, implied if not yet actually stated.

But Army Reserve organizations are neither trained nor equipped to deploy within hours; even some active-duty units lack that capability. The Army Reserve doesn't train and prepare to respond to civil emergencies; in each state, National Guard units have the responsibility to respond to the orders of the governor or the President in a crisis. And although the Army Reserve has some equipment, it does not have the substantial stores of decontaminants, antibiotics, or atropine sure to be needed in such a crisis. Perhaps most significantly, the Reserve's mission focus is warfighting, not disaster recovery or support to local and state domestic authorities.

The Army Reserve nonetheless has a disaster recovery mission--in this specific case, consequence management. Even

if it were not formally given to the Reserve, members of the Reserve would be accountable to their fellow citizens should they fail to provide aid when needed. So what can Reservists do to prepare themselves, and what resources does the Reserve need to do it?

The Total Army's chemical warfare organizations include soldiers who are specifically organized, equipped, and trained to respond to nuclear, chemical, and biological attacks on the battlefield. The active Army presently has three chemical battalion headquarters, one of which is in Korea, and a variety of other organizations with comparable missions.[32] However, in order to have space for maneuvers, most such units are located on military posts that generally are not near major cities. A high level of expertise is available in the Army's Technical Escort Unit, which is trained to identify and contain incidents involving weapons of mass destruction. The unit is small, however, and frequently has elements deployed over a wide area.

Similarly, the Marine Corps has a battalion-sized unit that was activated in April 1996 and trained in time to support the Atlanta Olympic Games. This unit, referred to as the Chemical-Biological Incident Response Force (CBIRF), can provide rapid assistance in a disaster involving certain kinds of contaminants. It augmented Olympics security in Atlanta and is capable of performing command and control, reconnaissance, decontamination, and medical assistance missions. It furnishes its own security and service support.[33] However, with the exception of security, each element in the USMC unit is small--about a squad for reconnaissance in specially designed and equipped vehicles and about a platoon for decontamination.[34] Though it offers an excellent model for rapid response to emergencies involving chemical or biological materials, the CBIRF is intended primarily for response to incidents involving State Department and Navy installations; it may also be sent overseas in response to threats to other US installations.[35]

National Guard units are located in cities and towns across each state and are each governor's primary military asset; they are commanded by each governor until they are federalized by executive order. National Guard personnel would be essential for maintaining order in the aftermath of a disaster, but chemical warfare units are located primarily within National Guard division organizations. The Guard has only two decontamination companies (at echelons above division) and its only battalion and brigade chemical headquarters units are scheduled to be inactivated. Once they are gone, there will be no chemical branch headquarters within the National Guard for command and control of specialized chemical units.[36]

The Army Reserve has eight battalion and three brigade headquarters, as well as 33 chemical companies capable of providing support to military units. Of that number, some 26 companies will be capable of performing decontamination missions after completion of the current modernization program and thus can provide a response to chemical weapon attacks by terrorists within the United States.[37]

To deal with a terrorist attack on the United States, resources would have to be provided by active, National Guard, and Reserve units of all the services. The first response would likely be from active units, such as the Army's Technical Escort Unit or the Marine's CBIRF battalion. However, based on available chemical assets and their proximity to population centers, the Army Reserve is in the best position to respond to a terrorist WMD attack on US territory with substantial numbers of personnel and equipment.

Rapid Response

Recognizing that time is the most critical factor in responding to a terrorist attack involving nuclear, biological, or chemical (NBC) weapons, the Department of Defense plans to establish a Chemical and Biological Quick Response Force (of about 500 soldiers) and place it under the Chemical and Biological Defense Command. This force is designed to respond rapidly to a WMD incident and, when deployed, will take orders from the Response Task Force of either First Army or Fifth Army, depending upon the location of the incident.[38]

Response time is important because effects from high concentrations of nerve agent continue to progress with exposure (maximum effects are usually reached within minutes after the exposure stops). Small amounts of liquid contamination, if not removed, can result in delayed effects up to 18 hours later,[39] making it unwise to completely ignore the possibility of contamination. To be most effective, atropine and pralidoxime chloride should be administered immediately after exposure, with diazepam given to reduce brain damage due to seizures.

With planning and training, significant Army Reserve chemical support could be available in affected areas within a few hours of an attack, ready to begin the search for additional casualties and identification of any contamination. If the agent was disseminated as an aerosol, there could be no residual contamination for the units to deal with.

Because Army Reserve units are spread throughout the United States, at least some chemical and medical units are within a few hours' driving distance of most major cities. There are two notable exceptions to this statement--the Midwest and the Pacific Coast regions. The closest chemical units to California (above the division level) are in Washington and Texas.[40] Under current staffing and planning guidelines, it is unrealistic to expect an entire Reserve unit to be able to assemble and move to an affected area in a few hours. It is not unreasonable, however, to expect a unit to send essential supplies (atropine, ciprofloxacin, etc.) within one or two hours, a small operations cell and perhaps a composite platoon within two or three hours, and the remainder of the unit in less than 24 hours.

Rapid response of personnel when dealing with the consequences of a terrorist attack is absolutely essential, but units cannot respond without planning and preparation. They need to know what is expected of them, where they will probably do it, and must always know who is available to do it with. Furthermore, basic equipment must be packed modularly and vehicles must be kept at a high level of maintenance. The National Strike Teams maintained and operated by the US Coast Guard provide an excellent model of preparedness for rapid deployment.[41] Given current funding and staffing restrictions, not every Army Reserve unit could operate at the tempo of our Force Support Package (FSP) units. To get started, perhaps we should initially focus on those types of units; recovery from a WMD attack is closely related to the wartime mission activities for which they habitually train. More units could be prepared for rapid response if provided the requisite funding and personnel allocations.

A Reserve unit's ability to respond to an emergency cannot be measured exclusively by time. The Army Reserve belongs to the federal government, not to the state; consequently it is constrained by the provisions of the Stafford Act concerning the services it can provide in support of civil authority. It is obvious, nonetheless, that if terrorists use weapons of mass destruction, the response cannot wait for normal procedures to be followed. Fortunately, an exception has been provided: "Under 42 U.S.C. 5170b reference (f) . . . the President may authorize the Secretary of Defense to use DOD resources for performing . . . emergency work that may ultimately qualify for assistance . . . which is essential for the preservation of life and property." In other words, based on the situation, "all military commanders are authorized to respond to requests from the civil sector to save lives, prevent human suffering, or limit property damage." [42] This is not a blank check, for commanders must notify in the most expeditious manner the DOD Executive Agent of their action; further, DOD emergency work cannot exceed 10 days without specific authorization. These constraints will have to be examined, however, for we are no longer discussing flood relief or controlling forest fires.

Command and Control

Command and control elements should be deployed to the affected area before or at least concurrent with the line units. Designated chemical battalion or chemical brigade control cells could deploy straight to planned control sites, with the senior officer on site taking command until relieved.

Unity of command is essential in any operation. In military support of civilian authority, the military chain of command runs from the Secretary of the Army (as executive agent) to the Director of Military Support (DOMS) in the Army staff, to the regional commanders in chief, to their component commanders, to the defense coordinating officer (DCO) located in the disaster field office. Coordination among state and federal agencies and the military occurs at two levels. The upper level includes the state governor, the Director of the Federal Emergency Management Agency, and the Director of Military Support. At the lower level it takes place at the disaster field office among the DCO, the federal coordinating officer (FCO), and the state coordinating officer (SCO).[43] Direct coordination must occur between Army Reserve commanders and their federal, state, National Guard, and local counterparts; [44] all should plan to provide liaison officers [45] to their counterparts involved in the relief effort. Successes and failures in the 1992 Los Angeles riots and the 1996 Atlanta Olympics demonstrate the importance of planning and continuous coordination in support of civil authorities, particularly law enforcement organizations.

Medical Assistance

A terrorist attack employing a radiation dispersal device would require immediate action, much as in response to a chemical attack. Medical personnel would need to deploy to the area, along with chemical units. There are no prophylactics or vaccinations for radiation, but symptoms of radiation sickness as well as the trauma effects from blast can be treated.

It is unlikely for economic reasons that major hospitals in our largest cities would stock large quantities of the drugs necessary for treatment of nerve agent poisoning. However, if some war stocks of nerve agent antidote kits and diazepam were divided among strategically located chemical or medical units, the military would have war supplies available and, if an emergency required it, the drugs would be available for civilian use. Of course, stocks would have to be rotated and diazepam (a controlled substance) would have to be adequately protected.

Severely affected nerve agent casualties, if they survived, would require lengthy and probably intensive hospital care, to include ventilation. Army Reserve hospital units could be activated and immediately deployed to safe zones around the affected area. Only units from outside the affected city or region should be called upon. To do otherwise could remove from the affected area medical personnel whose presence would be required at the local hospitals and clinics where they work in peacetime.

Search and Rescue

Army Reserve medical units should not be involved in search and rescue operations, and chemical units are no better trained than are the medics for such work. Army National Guard engineer and some combat units appear to be more likely candidates for this mission. Army Reserve chemical units can, however, identify hazardous chemical or radiological areas and are probably more capable than most units of protecting themselves from these hazards. Such units can be tasked to identify likely locations of victims as they conduct their survey of hazardous areas.

Hazardous Area Identification and Restriction

Some units are equipped with chemical and radiological monitoring equipment and should be able to survey an area attacked with nuclear dispersal, chemical, or biological weapons and determine whether or not contamination exists and if so, the extent of it. Results could be obtained quickly, except in the event of biological contamination; here samples would have to be submitted to a laboratory for analysis and positive identification (tests for "presumptive" identification of certain pathogens are possible in the field). Chemical detection reconnaissance vehicles were designed for much of this work, but are not at this writing available to Reserve units. Presently, and for the immediate future, decontamination and nuclear, biological, and chemical reconnaissance units would have to use vehicles and techniques that, although adequate, are far below the capabilities of current technology.

For years the military has trained many of its personnel to detect chemical and radiological hazards, and the required materiel is routinely available to most units. These units could be expected to help in conducting surveys and identifying contaminated areas. Biological hazards are different, however, for they pose far different detection problems. Presently only one company-size unit has the appropriate biological equipment. And even if the equipment were widely available, detection is based on air samples; once the airborne biological agent has settled to earth, the equipment's effectiveness is considerably reduced.

Decontamination

In normal combat operations, chemical units do not perform area decontamination; maneuver units are trained to avoid contaminated areas or to leave them as quickly as possible. Sometimes, however, seaports, airfields, or road junctions cannot be abandoned and chemical units may be called upon to perform decontamination operations over a wide area. Decontamination of urban areas will be a labor- and resource-intensive operation, made all the more difficult when current decontamination companies have been reorganized and no longer possess the heavy equipment useful in decontaminating terrain. An additional problem is the large amount of decontaminant needed to do terrain decontamination. Fortunately, commercially available substitutes, such as swimming pool chlorine, can be obtained in quantity as they are needed.

In all probability, large-scale decontamination of chemical agents would not be necessary. Decontamination of the

persistent *Bacillus anthracis* spores, on the other hand, could be a significant challenge since the spores are not easily detected on building surfaces or in topsoil. Decontamination is possible, however, and saturation with formaldehyde is a decontamination technique used effectively on Gruinard Island.[46]

Training

Reserve chemical and medical units will need to be assigned an area of responsibility and then charged with developing and coordinating contingency plans for responding to a terrorist WMD attack in their assigned areas. Unit training for this new support mission will have to be integrated into training for existing combat missions; the new mission will be urban, we won't be under hostile fire, and our logistics tail will be short.

Units will need to maintain a current roster of where key personnel are (perhaps utilizing pagers) for the purpose of quickly calling up small command and control cells to manage a situation as it develops. Units will also need to be sure they can operate with "composite" sub-elements, as they will not have the luxury of waiting until the entire force arrives before sending assistance to the stricken area.

Medical groups, police and fire departments, and civil defense organizations could benefit from periodic training on NBC operations from Reserve units and, ideally, participate in joint practical exercises. The Army (as part of the Department of Defense), in conjunction with five other federal agencies, recently began a training program to assist cities in planning for WMD consequence management. By tailoring requirements to a city's specific needs, this integrated training team expects to assist 120 major US cities over the next three years.[47] The Army Reserve, not presently participating in planning or conducting this training, has divisions dedicated to both individual training and the conduct of exercises. These divisions have skills that could be useful in compressing the time required for reaching the 120 cities.

There are significant potential benefits of applying the Army's concept of wargaming--board games first, then more sophisticated automated versions--to the challenges inherent in protecting American citizens from the effects of WMD attacks on the nation. The benefits these gaming processes have provided to the military can be realized in work with civil authorities as well. In fact, the interagency training team conducted an exercise for Denver, the first city to receive this training, in June 1997.[48]

Conclusion

President Eisenhower said that in preparing for battle, "plans are nothing; planning is everything." Plans must be in place before we can respond appropriately to contingencies, but without the will to review and exercise them, the plans will eventually lose their relevance. It is the process of updating assumptions and planning factors, identifying changes to what had been agreed--sometimes painfully--in earlier discussions, and getting to know new or replacement personnel that creates the basis for success of the mission. Consequently, the following actions are among the essential prerequisites to engaging Army Reserve personnel in managing the consequences of a terrorist attack involving weapons of mass destruction:

- . *Identify and resolve legal and other obstacles to rapid response in a crisis.* Hours are important in consequence management. Even though most Army Reserve units can do no more than begin deployment of a portion of their unit with a few hours' notice, the arrival of even a small advance party in the affected area could make a real difference to victims. Commanders must know that they are free to deploy their units and that their soldiers (or survivors) will have adequate protection or compensation for their operations in a hazardous environment. Issues such as authorization and notification procedures must be settled, as must such prosaic matters as the authority of designated unit commanders to respond to direct appeals from local authorities and activate unit assembly and movement plans.

- . *Establish a chain of command for consequence management that is clear and unambiguous.* WMD consequence management will involve federal, state, and local jurisdictions working simultaneously with civilians, public servants, and the military. Matters such as the place of the Army Reserve in the response hierarchy need to be examined, as well as command and control arrangements for the period immediately after an attack when perhaps only local police and

rescue, National Guard, and Reserve personnel will be on the scene.

. *Provide clear and executable missions to every unit assigned responsibilities for consequence management.* At least at the operational level, Army Reserve units have not been assigned the mission of consequence management in the aftermath of WMD use on American soil. Decisions on this issue should not be deferred. Introduction of an additional mission may not bring with it more time to train, but it will force the issue of limited resources and produce either compromises or the additional resources needed to respond satisfactorily to new tasks. Mission planning for responding to multiple simultaneous attacks will stress resources to an even greater extent.

. *Establish and maintain close working relationships with all responsible state and local authorities.* The Los Angeles riots demonstrated that if trust does not exist between civilian and military commanders before a catastrophe, efforts to develop it quickly under the pressure of events may not lead to success. Mutually developed plans, frequently updated, coordinated, and periodically rehearsed, are required if there is to be a seamless response to a disaster.

. *Prepare and conduct training.* For the most part, WMD consequence management, as seen from the chemical unit level, will not differ significantly from the type of activities already required in preparation for conflict. One could expect greater emphasis on operations in an urban environment, and planning processes will have to include local civil authorities. Exercises of the plans and technical training must by definition include civilian organizations. Good material well presented to local and state medical, police, and fire organizations will help establish confidence and trust in the military's capabilities.

. *Develop the capability to "surge" medical support to an affected area to ensure both immediate and long-term care.* Initial support from reserve component military medical units in the aftermath of an attack with weapons of mass destruction should be drawn from units outside the affected area. Coordination of medical response to the consequences of an attack will almost invariably involve several regions of the country and could conceivably extend into Canada and Mexico. Contingencies to be examined include responses to multiple simultaneous attacks. Caution must also be exercised in this regard; a common terrorist technique is to launch a second attack against those who rush to help victims of the first one.

. *Relocate existing chemical units or activate new ones to improve coverage of population centers.* Chemical units of all the services and components are significantly concentrated east of the Mississippi, away from populated areas of California and the Midwest. Decontamination companies in Washington State and Texas are too far from California's large population centers to be responsive in a crisis or readily accessible for the development, coordination, exercise, and rehearsal of essential contingency plans.

. *Evaluate the costs and prospective benefits of deploying modified versions of third-generation technology to selected metropolitan centers.* Modified detection devices could be permanently installed in hospitals, police departments, or other locations that are continuously occupied by skilled personnel. Early detection of biological attacks, including pathogen identification, could significantly reduce civilian casualties. Recent work by the Centers for Disease Control indicates that a biological attack affecting 100,000 people would be so costly that as much as \$250 million could be spent per year per potential attack area on early detection and intervention measures and still be fiscally responsible. These estimates are over and above sums presently being spent in those areas for police, fire, and rescue organizations, and for military units capable of responding in a crisis.

. *Identify, set aside, and maintain supplies and equipment necessary for consequence management.* Prophylactic substances should be properly identified, packaged, secured, and rotated. This would ensure that war stocks were current; it would also improve access to initial supplies for metropolitan areas. Planning would also take into account emergency measures for replacing stocks as they were depleted.

The mission identified and described in this article is in some respects an extension of survival and force protection on

the battlefield. It differs significantly from those functions, however, in that success will be determined by the quality of the partnerships we develop with civil authorities in every region where we envision a requirement for military support to those authorities. From those partnerships will grow the mutual trust and confidence needed to respond rapidly and effectively to any contingencies that threaten to overwhelm the capacity of local authorities to respond effectively.

Preparing for this mission will not excuse Army Reserve units from wartime missions, but prepare for it we must. If terrorists attack this country with weapons of mass destruction, we will have one chance to respond correctly.

NOTES

1. Chemical-Biological Incident Response Force, general officer's brief (photocopy), 17 December 1996, quoting Presidential Decision Directive 39, dated 21 June 1995.
2. One of the most successful terrorist groups was the "Assassins," an Islamic sect of the late 11th to 13th centuries, sworn to exterminate its enemies. Rafiq Zakaria, *The Struggle Within Islam* (London: Penguin Books, 1988), p. 145.
3. *Executive Seminar on Special Material Smuggling* (Carlisle Barracks, Pa.: Center for Strategic Leadership, 13 September 1996), p. 58. While the Tokyo attack gets all the press, the Aum Shinrikyo actually tested its sarin agent in June 1994. At that time members of the group sprayed an apartment complex in Matsumoto, Japan, in an effort to kill three judges. Although the judges did not die, seven other residents did and another 500 were injured.
4. "Testimony of The Honorable Morris D. Busby," US Senate, Permanent Subcommittee on Investigations, Committee on Governmental Affairs, 27 March 1996, accessed on the Internet on 23 November 1996 at <http://counterterrorism.com/busby.htm>. The US military is prepared to fight on a nuclear, chemical, or biological battlefield and carries protective equipment and prophylactics to support that fight. What must be remembered is that the military addresses "militarily significant" amounts of chemical agents, biological pathogens or toxins, or residual radiation; decontamination is the minimum necessary for mission accomplishment and contaminated terrain is vacated as soon as possible. Civilians do not carry protective equipment nor are they willing to abandon their homes and businesses and so they expect thorough decontamination, which may not even be possible.
5. Ibid.
6. Senator Richard Lugar, quoted in William C. Mann, "Terrorists With Doomsday Weapons a Growing Threat, Experts Warn," *The Atlanta Constitution*, 1 November 1995, p. A6.
7. Barbara K. Bodine (Acting Coordinator for Counterterrorism, US Department of State), *Patterns of Global Terrorism: 1993* (Washington: GPO, 1994), p. iv.
8. Marvin J. Cetron and Owen Davies, "The Future Face of Terrorism," *Futurist*, 28 (November 1994), 12. The authors point out that religious and ethnically motivated terrorists are more willing than most to use whatever means necessary to accomplish their aims. They consequently will not shrink from mass murder, for they believe they are struggling against "the forces of darkness."
9. *Executive Seminar on Special Material Smuggling*, p. 28.
10. Robert L. Pfaltzgraff, Jr., and Richard H. Shultz, Jr., eds., *Ethnic Conflict and Regional Instability: Implications for US Policy and Army Roles and Missions* (Washington: GPO, circa 1994), p. 40.
11. *Executive Seminar on Special Material Smuggling*, p. 25. Weapons grade 94Pu239 or 92U235 are not required for a radiation dispersal device. Combining conventional explosives with Cesium-137, Cobalt-60, Strontium-90, or plutonium oxide can contaminate a wide area for years to centuries.
12. Robert Harris and Jeremy Paxman, *A Higher Form of Killing* (New York: Hill and Wang, 1982), p. 158.

13. Edward M. Spiers, *Chemical and Biological Weapons--A Study of Proliferation* (New York: St. Martin's Press, 1994), p. 170. The FBI has found cyanide held by the Revolutionary Action Movement (1967) and the Covenant Sword in the Arm of the Lord (1985), typhoid cultures held by the Order of the Rising Sun (1972), and nerve agent on an assassin planning to kill the president in Washington (1974). Terrorists can get agents, toxins, or pathogens from sponsor states or through theft or fraud from legitimate laboratories or supply firms.
14. Andrew Pollack, "Japanese Police Say They Found Germ-War Material at Cult Site," *The New York Times International*, 29 March 1995, p. A10.
15. Joseph D. Douglass and Neil C. Livingston, *America the Vulnerable* (Lexington, Mass.: Lexington Books, 1987), p. 24.
16. Bruce W. Nelan, "The Price of Fanaticism," *Time*, 3 April 1995, p. 40.
17. US Congress, Senate, Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Spread of Chemical and Biological Weapons*, Hearings, 101st Cong., 1st sess. (Washington: GPO, 1989), p. 32.
18. Abram S. Beneson, ed., US Army Field Manual FM 8-33, *Control of Communicable Diseases in Man* (Washington: US Dept. of the Army, 31 May 1991), p. 18. An official report of the American Public Health Association, this FM provides information such as mode of transmission, incubation period, fatality rate, and methods of control of a large number of diseases.
19. Interview with Arnold F. Kaufmann, D.V.M., and Martin I Meltzer, Ph.D., on the topic of "The Economic Impact of a Bioterrorist Attack," 16 January 1997, Centers for Disease Control and Prevention, Atlanta, Ga. Dr. Kaufmann and Dr. Meltzer have addressed the threat of a terrorist biological attack from a novel and useful point of view. Doctrinally sound delivery methods were coupled with a high-sided LD50 and a very conservative casualty rate, all designed to determine an economically conservative range of intervention costs that were actuarially equated to annual premiums. Essentially, this study determines the amount of money the country could spend on preparing for a biological attack from an economic viewpoint. This analysis determined that the overriding factor in minimizing the effects of a biological attack is the rapid initiation of a prophylaxis. The recommended treatment for anthrax is 28 days of doxycycline or ciprofloxacin coupled with vaccination. Effective intervention requires planning, training, and propositioned supplies.
20. Jon H. Moilanen, "Engagement and Disarmament: A US National Security Strategy for Biological Weapons of Mass Destruction," photocopy, Carlisle Barracks, Pa., US Army War College, p. 10. Biologic agents may be used to attack people, animals, or crops. Inhalation anthrax is fatal in extremely small doses. Vaccinations after infection are essentially useless (unless the bacillus remains in spore form for an extended period) due to the time required to develop antibodies.
21. US Department of the Army, Field Manual FM 3-9, *Potential Military Chemical/Biological Agents and Compounds* (Washington: US Dept. of the Army, 12 December 1990), p. 107.
22. Andrew Bilski and Sudvendrini Kakuchi, "Tokyo Terror," *Maclean's*, 3 April 1995, p. 29. Sarin is fatal to humans at a ratio of one to 100 million parts by weight.
23. William C. Mann, "Terrorists With Doomsday Weapons a Growing Threat, Experts Warn," *The Atlanta Constitution*, 1 November 1995, p. A6.
24. G. A. Cristy and C. V. Chester, *Emergency Protection from Aerosols* (Oak Ridge, Tenn.: US National Laboratory, July 1981), p. 23. This study was commissioned by the Department of Energy to determine the most effective means of protecting families inside their homes from a toxic aerosol passing over their dwelling. *Bacillus globegii* spores (average diameter of 2 microns) were used as the aerosol agent. Findings indicated that for an aerosol threat-duration longer than the structure's air exchange rate, protection factors of only about 3 were obtained. For aerosols of short threat-duration (where structures were opened and ventilated after cloud passage) protection factors of 10-200 were obtainable. If filtration devices and positive pressure systems are placed on the houses (accomplished with a simple

vacuum cleaner) and the houses are ventilated after cloud passage, protection factors of as much as 7000 can be obtained. Interestingly, of five experimental arrangements of vacuum cleaner filtration set-ups, the most effective was a dirty bag with three months' accumulation of debris. (It is obviously essential to know the aerosol cloud is coming and when it has passed.)

25. Telephone interview with Arnold F. Kaufmann, D.V.M., on topics of intervention requirements of victims and the contamination effects of *Bacillus anthracis*, 7 February 1997, Centers for Disease Control and Prevention, Atlanta, Ga. Computer models run by Dr. Kaufmann indicate that *Bacillus anthracis* disseminated as an aerosol will deposit the heavier particles (those poorly milled or aerosolized) within 700-1000 meters of the line of dissemination. Once deposited on the ground, the threat of re-aerosolization is negligible. This relatively narrow band of contamination assumes the pathogen was spread from a vehicle with optimal atmospheric conditions (particle deposition depends on such factors as height of dissemination and wind speed). Lighter particles (those of neutral buoyancy) will stay aloft almost indefinitely--at least until the spores have been killed (by ultraviolet light, etc.). Even before complete destruction, pathogens can incur a loss in both viability (being alive) and virulence (ability to produce disease) during their downwind drift. Dr. Kaufmann's studies indicate intensive and early intervention after a biologic attack can significantly reduce fatalities and improve victim recovery. For example, inhalation anthrax had a mortality of perhaps 95 percent or more in the pre-antibiotic era; intensive modern treatment begun after symptoms have appeared can reduce mortality to 70-95 percent. Treatment begun before the appearance of symptoms can bring mortality significantly below 70 percent. Due to the short incubation period of some pathogens (i.e., *Bacillus anthracis*) it will be essential for civilians in the area of attack to be informed quickly where they should go to receive treatment. Successful intervention involves adequate antibiotic prophylaxis and vaccination availability, informing citizens where to obtain treatment, and personnel to prevent or control population panic.

26. US Army Medical Research Institute of Chemical Defense, *Medical Management of Chemical Casualties--Handbook* (Aberdeen Proving Ground, Md.: Dept. of the Army, September 1995), pp. 17, 30-32. This is an extraordinary handbook discussing such things as symptoms, decontamination, immediate management, and triage; it is written in plain language and is useful to the nonspecialist.

27. Ralph Trapp, "The Detoxification and Natural Degradation of Chemical Warfare Agents," Stockholm International Peace Research Institute (London: Taylor and Francis, 1985), p. 90. This SIPRI document lists various detoxicants and comments on their effects on chemical agents. It is particularly interesting in that it discusses ground decontamination using chemicals that are not military standard, as well as STB.

28. Beneson, p. 67.

29. Kaufmann and Meltzer interview.

30. US Department of the Army, Field Manual 3-19, *NBC Reconnaissance* (Washington: Dept. of the Army, 19 November 1993), p. A-2.

31. US Congress, House of Representatives, Conference Report on H.R. 3230, National Defense Authorization Act for Fiscal Year 1997, *Title XIV--Defense Against Weapons of Mass Destruction* (Washington: GPO, 1996), p. 3.

32. Telephone interview with Major Bill Van Nuys, FORSCOM Plans, Chemical Organizational Integrator, and briefing presentation on US Army Chemical Units (photocopy), 14 January 1997. The Total Army has 43 chemical companies at echelons above division, four brigade headquarters, and 12 battalion headquarters. The last National Guard Chemical Brigade Headquarters (404th) and Battalion Headquarters (44th) are scheduled to deactivate in the near future.

33. Chemical-Biological Incident Response Force, general officer's brief (photocopy), 17 December 1996, prepared for Generals Friel, Broderick, and Berndt. The CBIRF is mission ready. It consists of command, reconnaissance, decontamination, medical, security, and service support elements. Also associated with the CBIRF is a distinguished civilian advisory group and a mobile laboratory capable of detecting and identifying biological agents. See also Captain Chris Seiple, USMC, "Confronting the Domestic Consequences of WMD," in this issue of *Parameters*, 27 (Autumn 1997), 119-34.

34. Sergeant Lance M. Bacon, USMC, "Incident Response Force," *Surface Warfare*, 21 (November- December 1996), 19. The CBIRF's medical team, although small (six medical officers and 17 corpsmen) is trained in treating all types of chemical and biological casualties. It would be an excellent element to supervise the work of medical staffs less skilled in these areas.
35. Major Joseph Osterman, USMC, "Who Will Answer the Chemical/Bio Call?" *Proceedings*, 122 (December 1996), 40. Timeliness and coordination are the most important aspects of a response to biological or chemical incidents. Coordination of a response is really a function of FEMA, but DOD has a greater capability to handle large-scale activities (e.g., Hurricane Andrew). The US Atlantic Command has been given the task of providing DOD support for the 48 contiguous states, Puerto Rico, and the Virgin Islands. To accomplish this mission, incident response units must be able to deploy rapidly, provide a nucleus for expansion, be technologically current, have a command structure able to influence decisions at the flag level, maintain security, conduct triage, and treat casualties. "Pick-up" response teams will clearly be less effective than integrated units whose members have trained together. No organization currently exists that can fill these requirements by itself.
36. Telephone interview with Major Bill Van Nuys and briefing presentation on US Army chemical units (photocopy), 14 January 1997.
37. Ibid. There are one BIDS, two reconnaissance, four mechanized smoke, 17 motor smoke, and nine decontamination companies in the USAR.
38. Telephone interview with Lieutenant Colonel John Ontiveros, Chemical and Biological Defense Command, 18 June 1997. The Department of Defense will never control operations, even when responding to an incident. The Chemical and Biological Defense Command office serving as the Army's lead agent in planning the training for and response to incidents of domestic WMD terrorism will for the first time be assigned representatives from the National Guard and Army Reserve not later than July 1997.
39. US Army Medical Research Institute of Chemical Defense, *Medical Management of Chemical Casualties-- Handbook*, p. 27.
40. Telephone interview with Major Bill Van Nuys and briefing presentation on US Army chemical units (photocopy), 14 January 1997.
41. Telephone interview with Lieutenant Commander Denise L. Matthews, USCG, on the topic of "US Coast Guard National Strike Force Mission," 9 January 1997. Coast Guard Strike Force units respond to oil and hazardous chemical incidents. Although there are only three of these units, they are well situated to respond to emergencies (Atlantic Strike Team, Fort Dix, N.J.; Gulf Strike Team, Mobile, Ala.; Pacific Strike Team, Novato, Calif.). The National Strike Force Coordination Center controls each of these 38-member teams. All response equipment is palletized, loaded, and ready for immediate deployment by air or ground. Each team is able to dispatch two members immediately, four within two hours, and 12 within six hours.
42. US Department of Defense, Manual DOD 3025.1-M, *Manual for Civil Emergencies* (Washington: US Dept. of Defense, June 1994), pp. 2-11.
43. Ibid. The DOD response structure parallels the state and FEMA structures. The real key to success is the coordination that takes place between the SCO, the FCO, and the DCO.
44. Christopher M. Schnaubelt, "Lessons in Command and Control from the Los Angeles Riots," *Parameters*, 27 (Summer 1997), 88-109. Author identifies where military operations worked well during the riots and where they did not. When mid-level law enforcement leaders and the military units supporting them took the initiative to talk together, operations went smoothly. The civil disturbance was a non-linear "battlefield" and consequently many prepared plans, when they existed, just didn't apply, so support operations had to be negotiated in the field.
45. Major General William P. Bland, TAG, GAANG, report, "After Action, OPERATION CENTENNIAL GUARD, 1

June - 25 August 1996," 20 December 1996, p. 13. Active-duty and National Guard soldiers supported security operations at the 1996 Olympics in Atlanta. A total of 13,968 Guard Members from 47 states and territories, all under the command and control of the Adjutant General of Georgia, worked with ACOG security and state and local law enforcement. Liaison operations were essential to facilitate information flow between the Georgia National Guard TF G-2 and the numerous intelligence groups supporting the Olympics.

46. R. J. Manachee, et al., "Out of Gruinard Island," in *Proceedings of the International Workshop on Anthrax*, held in Winchester, England, 11-13 April 1989, ed. Peter C. B. Turnbull (Wiltshier, Eng.: Salisbury Medical Society, 1989), p. 17. During World War II, the British conducted tests to determine the viability of explosively disseminated *Bacillus anthracis* spores as a biological weapon. The tests were a success, but annual checks for more than 20 years after the war showed that large numbers of virulent spores persisted in the soil. The entire island was not contaminated, however--only 3.7 hectares in the test area. After analysis indicated that the spores would not decay to undetectable quantities until around 2050, the Ministry of Defense directed that the area be decontaminated with the intent of returning the island to civilian use. Tests of various biocides conclusively indicated that formaldehyde was most effective. Not only did it have a high sporicidal activity and persistence in peat, but it denatured living organic matter into fertilizer-like properties. An application of 50 liters per square meter of five percent formaldehyde was used to sterilize the soil to a depth of 15 cm (with greater concentrations of formaldehyde injected in areas of heavier contamination). Testing for residual contamination was done and some retreatment was necessary, but in October 1987 no more *Bacillus anthracis* was found.

47. "US DOD: Background briefing--Domestic Preparedness," M2 Press, Wire, 1 April 1997, p. 3, accessed on the Internet on 18 June 1997 at <http://www.elibrary.com>. The agencies involved in this training program are the Department of Defense, Federal Emergency Management Agency, Federal Bureau of Investigation, Department of Energy, Environmental Protection Agency, and the Public Health Service.

48. Ontiveros interview, 18 June 1997.

Colonel Charles L. Mercier, Jr. USAR, has served in both the National Guard and the Army Reserve, and as an infantry and a chemical officer. A major at the time, he commanded the first Army Reserve chemical unit to deploy to Saudi Arabia during Desert Shield and Desert Storm. His unit, the 907th Chemical Detachment, supported both the 593d Area Support Group and the Prince Abdul Rachman al Saud Light Infantry Brigade. He subsequently commanded the 490th Chemical Battalion and served as S3 of the 415th Chemical Brigade. In 1997 he became Deputy Chief of Staff, Logistics, for the 81st Regional Support Command. A graduate of the Army Command and General Staff College and the Army War College, Colonel Mercier holds an M.S. degree in nuclear physics from the University of Alabama.

Reviewed 22 August 1997. Please send comments or corrections to carl_Parameters@conus.army.mil