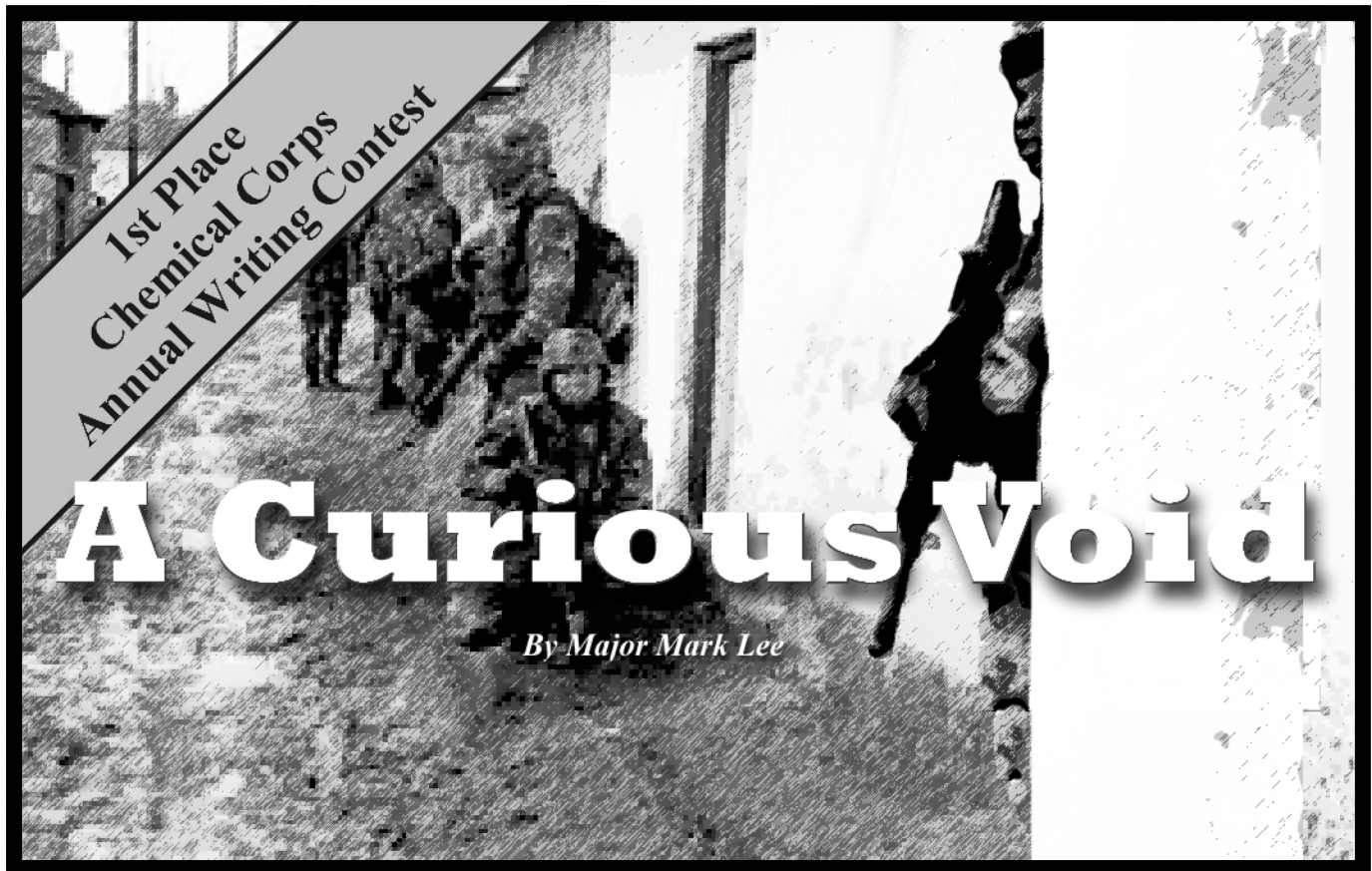




*"We run into a curious void in the literature of warfare. Most practitioners of the Art who are also its ablest theorists, scholars, and writers dwelt on its varied aspects to the limits of their imagination. One thing, however, they did not touch upon—combat, where life is centered. Run through the list of writers and their works—Frederick, de Saxe, Clausewitz, Jomini, Kuropatkin, Bernhardt, Henderson, Foch, Fuller, Hart, et al. Not one has anything to say about military operations within or against the city. The subject was too sticky, too little understood, or it was dismissed as unimportant."*¹ — S.L.A. Marshall

This curious void exists despite the long history of combat in cities. Thucydides wrote of city combat thousands of years ago. His account of the battle in the streets of Plataea described many of the contemporary urban combat challenges.² Sun Tzu, an ancient philosopher, strongly counseled avoiding city combat altogether. "This tactic of attacking cities is adopted only when unavoidable."³

Warfare has changed in many ways since then, but surprisingly military doctrine has remained the same—avoid combat in cities if possible. Current urban operational doctrine is FM 90-10, *Military Operations on Urbanized Terrain*, published in 1979. Written to guide fighting on the urban battlefield of a Cold War Europe, the relevance of the manual for current operations is questionable. This doctrine has not changed in spite of the Army's capstone doctrine—FM 100-5, *Operations*—undergoing four revisions. The 1993 version devotes only 75 words to the challenge of

urban operations and refers the reader to the then 14-year-old FM 90-10. It appears that Sun Tzu's advice was a heavy influence in that urban terrain was to be avoided whenever possible.

FM 90-10-1, *An Infantryman's Guide to Combat in Built-Up Areas* (written in 1995), attempts to address some of the shortcomings of FM 90-10, but its focus is a "how-to-fight" manual. FM 90-10-1 provides the "infantryman with guidelines and techniques for fighting against an organized enemy in built-up areas who may or may not be separated from the civilian population."⁴ The organized enemy is one that is fighting a conventional fight, head-to-head against U.S. forces. The manual does not address the interaction of the civilian population within the city. It is designed for a World War II-type battle where collateral damage is not an operational concern. Rubbling entire blocks remains a viable course of action.

“As anybody who has had experience with the Chetniks in Serbia, ‘technicals’ in Somalia, Tontons Macoutes in Haiti, or soldiers in Sierra Leone can tell you ... where there has always been mass poverty, people find liberation in violence.”

Robert D. Kaplan, *The Coming of Anarchy*

Disregarding this doctrinal void, the world's population continues to migrate into larger urban complexes. In 1990, a fundamental change took place in the world demographics. For the first time in history, more people lived in urban areas than outside of them. The size and complexity of existing cities have grown accordingly. A new term, megacity, is reserved for large urban complexes with a population of more than 1 million.⁵ Today, 20 percent of the world's population lives in a megacity. By 2020, that figure will rise to almost 30 percent.⁶ Megacities are becoming more common in underdeveloped nations. Unfortunately, the poorer citizens, who are more dependent on the inadequate infrastructure of the urban complex, are populating these cities. The population requires a level of support beyond what the local governments can supply. Most new city dwellers live in slums or shantytowns around the periphery of the city. Frequently, these living conditions are worse than the ones they left.

These megacities are an incredible drain on the environment, and they frequently disregard international borders. Along the Ivory Coast of Africa, the continuous megacity that is visible from satellite imagery straddles five struggling nations.⁷ The infrastructure of the megacity cannot keep up with the explosive growth of the population. Overpopulation creates sanitation hazards, and pollution runs unabated. These urban complexes defoliate the countryside in a feeble sustaining effort. In essence, megacities are consuming the countryside to feed an insatiable hunger that eventually will leave a barren landscape incapable of supporting life, even in the shantytowns. As the overcrowding increases, the urban complex divides more on ethnic and economic lines rather than on geopolitical ones.

As more and more people migrate into the larger cities, so do the insurgent forces and criminal elements. Insurgent forces, used to drawing their support from the rural society, now have followed the rural population into the city. Cities are unable to exert any influence in these shantytowns, and the insurgent forces and criminal elements quickly fill that void.⁸ The destitute living conditions produce a large population of inactive males who are ripe for recruitment. Additionally, just as the drug culture offers quick riches for disenfranchised urban American youths, insurgent forces in the megacity present the promise of a better way of life than the day-to-day existence offered by the government. “As anybody who has had experience with the Chetniks in Serbia, ‘technicals’ in Somalia, Tontons Macoutes in Haiti, or soldiers in Sierra Leone can tell you ... where there has

always been mass poverty, people find liberation in violence.”⁹ To quote Chairman Mao, “Their lifestyle comes from the barrel of a gun.” This liberation has created a different type of warrior. These killers are motivated by the short-term riches and intoxicated by their newfound power. We will face these forces in the future.

Facing the Future

The future antagonist of a U.S. involvement cannot match us conventionally—head-to-head battle. Given the advanced capabilities of precision fires, future antagonists must look to cities as safe havens from precision-guided munitions and other advanced weaponry. “An enemy seeking asymmetric advantages will be hard-pressed to find an alternative more likely to neutralize the U.S. superiority than urban operations.”¹⁰ The division and isolation of U.S. forces caused by the urban terrain present a tremendous opportunity to apply asymmetrical attacks against the U.S. forces. As witnessed in the past decade in Somalia and Chechnya, the urban environment neutralizes the standoff advantage of many advanced weapons.

Planners for the Army Transformation process have realized the significant challenges in military urban operations and have focused a large amount of research on this topic. War games, Army warfighting experiments, advanced-concept technology demonstrations, and other methods have identified some requirements for operations on urban terrain and highlighted Army current doctrinal, force structure, and training shortcomings. All of these efforts represent the U.S. Army's attempts to fill the “curious void” in the study of urban operations. Most of these efforts focus on advancements for the individual soldier. However, if this shortcoming in urban doctrine is just a void, then the gap in doctrine for recognizing and mitigating the many urban hazards represents a gaping abyss.

An Unseen Hazard

In the famous chemical attack at the battle of Ypres in 1914, German forces released 168 tons of chlorine gas against an Allied force void of any protective equipment. The attack caused 5,900 casualties.¹¹ The chemical weapons used in World War I were, with the exception of phosgene, casualty makers and not killers. They were used to reduce the efficiency of the opposing force and the increased burden placed on the medical and logistical systems. As Heller pointed out, 31 percent of all wounded treated in the Allied Expeditionary Force facilities were for gas wounds.¹²

A New Danger

In addition to the conventional chemical weapons, the future antagonists will have access to toxic industrial chemicals (TICs) and toxic industrial materials (TIMs), as well as the historically regarded weapons of mass destruction (WMD) agents. The operational significance of these materials was doctrinally recognized in the new Joint Publication (JP) 3-11, *Joint Doctrine for Operations in Nuclear, Biological, and Chemical (NBC) Environments*. It defined an NBC environment as one that “includes the deliberate or accidental employment or threat of NBC weapons and attacks with other chemical, biological, or radiological materials or TIMs.”¹³

The asymmetrical advantage offered by these agents is sobering. U.S. forces currently do not have the means to detect them.¹⁴ For the most part, they don’t require a delivery system, they are just as lethal as the “traditional” chemical warfare agents, and they have worldwide availability. These combinations of agents and materials present a wide range of employment options against the U.S. forces and the civilian population. The complexities of the urban environment and the current U.S. lack of understanding of the hazards provide the foe an opportunity to use these hazardous materials. Use of these materials would influence the U.S. mission significantly. Even an accidental release of a hazard source in the city would present a serious operational challenge that we are not prepared to face.

The effects of TICs can be just as lethal. In 1983, 40 tons of methyl isocyanate were released in Bhopal, India; 8,000 people died overnight, over 20,000 died in the ensuing months, and about 500,000 remain affected today.¹⁵ In many cases, the lethality of these TICs¹⁶ can be greater than those traditionally considered chemical warfare agents. As cities modernize, the presence of the TICs throughout the urban complex grows exponentially. No longer confined to an industrial park, TICs represent a hazard everywhere. The hazard in underdeveloped megacities is even more profound. Without the resources or time available to provide basic sanitation needs, local governments are incapable of enforcing an effective hazardous material control program. Even our country has difficulty controlling hazardous materials properly all of the time.¹⁷ Their presence in today’s sprawling urban environments represents an operationally significant challenge to the U.S. force.

Mission Responsibility

JP 3-11 establishes TICs as operationally significant hazards in the battlespace. While this is a good first step in identifying the problem, there is still some confusion over the implications of this new mission. Although Joint doctrine is prescriptive in nature, JP 3-11 fails to designate a single proponent. This approach leverages the expertise available in the different proponents but violates the principle of unity of effort. The division of labor fails to leverage the

expertise—distribution of the appropriate knowledge and equipment during an operation. While this technique does ensure participation by all parties, it does not reflect the operational realities facing a commander today.

Three essential players in the mission to protect the force from TICs are health services, as the preventive medicine (PVTNMED) team; the engineers, as the Army’s environmental stewards; and the Chemical Corps, as the NBC experts. Rather than dissect a mission statement from these proponents, it would be more useful to review their missions in support of Operation Joint Endeavor (OJE) in Bosnia-Herzegovina.

The PVNTMED effort for OJE was unique and very successful. Faced with an operationally challenging mission with a large area of responsibility, the scope of the PVNTMED effort required a comprehensive plan. Most of the effort focused on the many disease risks the OJE soldiers faced. The mission of the deployed PVNTMED team was to “preserve the health of deployed U.S. forces and establish countermeasures to the risk of disease and injury.”¹⁸ The main effort was to prevent deployed soldiers from contracting serious and fatal diseases prevalent in the Balkans. Protection of the force in the base camps was a critical task, and the PVNTMED teams eventually came up with quantifiable standards to measure the protection of the various facilities.¹⁹ Their environmental-sampling procedures focused primarily on the base camps. Concerned about the air quality in the Tuzla Valley, the teams began comprehensive air monitoring. They also found time to collect 2,300 environmental samples of soil and water during the first year. Although a theater-support medical laboratory later deployed to Bosnia, most of the samples went to facilities in the continental United States.²⁰ Despite the large number of samples taken, the PVNTMED team focus remained inside the wire of the base camp.

The engineer effort for OJE began with the bridging of the Sava River. Yet, as the Army proponent for environmental matters, the Engineer Corps quickly moved



A reconnaissance squad leader uses the mobile mass spectrometer to identify an environmental sample.

into that portion of its mission to ensure environmental compliance of the OJE forces. The purpose of these efforts was two-pronged: to keep the force from creating a hazard that would adversely affect mission accomplishment and to comply with established hazardous material handling procedures.²¹ All of these efforts were very effective in the protection of the force and the environment. In fact, the United States often found itself cleaning up hazardous materials left in the base camps from previous occupants.²²

Thanks to the efforts of the PVNTMED and engineer teams, the base camps occupied by U.S. personnel were the healthiest grounds in the Balkans. The deployed force showed a disease and non-battle-injury rate much lower than expected.²³ It rightly focused all of its efforts inside the wire.

The Chemical Corps units deployed to OJE focused their efforts **outside** the wire. The 1st Armored Division chemical section recognized early in the planning process that there were operationally significant hazards in the area. Its efforts led to numerous intelligence requests. These efforts culminated in the execution of several command-post exercises for the division and chemical battle staffs to work out the difficulties presented by toxic substances in the battlespace.²⁴ While it took time to convince the command of the importance of this aspect of mission analysis, the operationally significant impact a TIC release could have on the OJE mission became clear. Once the forces entered the Balkans, chemical soldiers began their environmental reconnaissance mission. Taking advantage of the environmental chip in the M93 Fox, they were able to move quickly throughout the area of operations and confirm or deny the presence of toxic materials.²⁵

Several important lessons evolved from these operations. First, it demonstrated that commanders in the field routinely look to the chemical battle staff to be their advisor for these matters.²⁶ From division level and down, the chemical soldier was the one with the commander's finger in his chest. Chemical soldiers are expected to offer the same mission-oriented advice to the commanders for toxic chemicals as well as traditional NBC matters. For once, Joint doctrine reflects reality. Second, the hazards are out there; recon teams found both chemical and radiological hazards during their surveys. Third, these missions also validated the capability and responsiveness of the M93 mass spectrometer.²⁷

Filling the Void—A New Mission—A New Future

As we move into the next century, our Army is transforming. The road map for Chemical Corps transition remains unseen. One capability we must retain for the future is the ability to protect the force from the effects of TIMs. The Chemical Corps needs to establish itself as the doctrinal and operational leader for our armed forces in this important



An environmental reconnaissance being conducted at a U.S. site in Northern Bosnia

field. We must have this mission for four simple reasons: First, we already have the battle staff and chemical units in place. Second, experience demonstrates that chemical soldiers are the assets the commanders are sure to go to when faced with a difficult situation. Third, increasing our knowledge base to include TIMs is an incremental, not exponential step. Last, we consider the vision statement from Chemical Vision 2010—"The ability to protect the force throughout the depth of the battlespace and across the full spectrum of operation environments."²⁸

This is our curious void. It's time to step up to the plate and take our best swing at this important new mission for our Army. We must be the experts outside the wire, for no one else can.

Endnotes

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¹³Joint Chiefs of Staff, Joint Pub 3-11, *Joint Doctrine for Operations in Nuclear, Biological and Chemical (NBC) Environments*, Washington, D.C.: Department of Defense, 11 July 2000, p. I-1.

¹⁴While the M93 can be outfitted with an improved chip to allow its mass spectrometer to identify an expanded library of toxic industrial chemicals, it would be a stretch to say we have the capability to monitor effectively.

¹⁵Yogi Aggarwal, *The Union Carbide Unforgiven*, <http://iwnetwork.com/subscribe/news/bgnd/991209-union.html>: 9 December 1999.

¹⁶Industrial chemicals, as defined in JP 3-11, "industrial chemicals: chemicals developed or manufactured for use in industrial operations or research by industry, government, or academia. These chemicals are not primarily manufactured for the specific purpose of producing human casualties or rendering equipment, facilities, or areas dangerous for human use. Hydrogen cyanide, cyanogen chloride, phosgene, and chloropicrin are industrial chemicals that also can be military chemical agents." (This term and definition are approved for inclusion in the next edition of JP 1-02.)

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