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TANGLED UP IN KHAKI AND BLUE: LETHAL AND NON-LETHAL WEAPONS IN RECENT CONFRONTATIONS

DAVID A. KOPLOW*

"I helped her out of a jam, I guess, but I used a little too much force."

Bob Dylan, "Tangled Up in Blue" 1974

I. INTRODUCTION

The governmental mechanisms that exercise a state's physical coercive power—various cadres of military and law enforcement agencies—often face a difficult dilemma. In confrontations with recalcitrant opposing forces, the authorities must recognize that if they exercise *too much* power, they incur an unacceptable danger of "collateral damage," unintended casualties to civilians and unnecessary destruction of valuable property. On the other hand, if they exercise *too little* power, they may risk the safety of their own personnel and compromise the accomplishment of an important and legitimate mission.

In recent years, this dilemma has arisen with painful frequency inside the United States and elsewhere. Officials increasingly express frustration at having only an impoverished array of tools at their disposal, especially regarding confrontations in which the specific target of the police or military forces is intermingled with civilians or innocent bystanders. Government actors may have only "bullhorns or bullets" to choose from; if emphatic verbal instructions and warnings do not suffice, the only recourse official forces have is the application of deadly force, which often cannot be applied with anything like the desired surgical precision.

This Article presents that dilemma in the context of the imminent development of a novel toolkit of so-called "non-lethal weapons" (NLW),

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which promise to radically alter the existing Hobson's choice. These armaments—a wide range of technologies, new and old, incorporating different types of physical mechanisms, capable of both anti-personnel and anti-materiel operations—seek to provide a viable intermediate capability, for the first time affording governmental actors additional options in volatile situations. These emerging capabilities include a breathtaking array of devices such as enhancements of the traditional “rubber bullets”; foam sprays that make a surface either impossibly slippery or impassively sticky; millimeter wave “heat rays” that peacefully repel people without inflicting lasting harm; projectile netting or other entangling devices to capture individuals or vehicles; chemicals that temporarily irritate, repel, or becalm a person; biological agents that embrittle metal or contaminate petroleum products; and many more.

This Article examines three representative recent confrontations: the 1993 shootout and siege at Waco, Texas, involving federal ATF and FBI units against the Branch Davidians led by millennialist David Koresh; the 2002 seizure of the Dubrovka Theater in Moscow by Chechen separatists; and the 2003 Gulf War II fighting by the British Army against indigenous resistance in Basra, Iraq. Although in each of these episodes government forces “prevailed” in some crude sense, each was at least partially unsatisfactory, resulting in more carnage and more destruction than anyone would have wanted. Therefore, the goal of this Article is to determine whether the availability of a richer configuration of non-lethal weapons might have made a difference.

These three case studies provide an array of contrasts: they occurred on three different continents, they involved three different countries and three different types of resistance units as protagonists, and they engaged notably different genres of armaments and tactics. In addition, the three selected incidents are usefully diverse in yet another regard. The first, Waco, was clearly a law enforcement operation, initially occasioned by the effort to serve ordinary arrest and search warrants. In contrast, the third, Basra, was plainly a conventional military operation, occurring in the midst of a broad-gauged international armed conflict. The second, Moscow, presents a sort of middle ground, containing aspects of both law enforcement and military counter-terrorism operations, thereby illuminating the rainbow of legal and policy considerations at play.

This Article does not argue that non-lethal weapons *should* have been applied in these confrontations, or that they necessarily *would* have made a profound difference in resolving the clashes at appreciably less

LETHAL AND NON-LETHAL WEAPONS

cost. It may be that these instances were simply intractable, that the opposing forces were so resistant, fanatic, or entrenched that even improved technology and tactics would have proven unavailing. Still, the hypothetical inquiry remains: in these three tragic cases, what might have happened if the respective governments had been able to try something else—something non-lethal?

The Article proceeds in the following steps. First, Section II surveys the emerging world of non-lethal weapons, beginning with the observation that the very name “non-lethal” is at least partially misleading; any application of force by police or military units inherently carries the potential for death. Although this new family of technologies at least attempts to reduce greatly the probability of mortality and widespread destruction of property, it offers no absolute guarantees.

Section II also describes a variety of NLW technologies, starting with the more familiar devices long used by governments around the world, such as tear gas, water cannon, and plastic bullets, among others. It then introduces some of the more tantalizing possibilities that loom on, or just over, the horizon: gizmos that disable or deter, that ensnare or blockade, that corrode or contaminate. Section II also describes some of the animating spirit behind the investigation of, and the burgeoning investment in, these esoteric capabilities: the classic scenarios in which military and police forces imagine they would be better able to control incendiary situations, perform their assigned missions, and protect themselves and any bystanders with greatly reduced fatalities and destruction.

Next, Section III assesses the law applicable to non-lethal weapons, starting with the international legal constraints upon battlefield violence. Treaties that regulate chemical, biological, and other categories of specialized conventional armaments are highlighted, along with the more general evolving law of armed conflict. This body of law was crafted largely with other kinds of implements of war in mind, but it must now adapt to embrace NLW as well. Domestic United States law also governs non-lethals, constraining both the research on selected armaments concepts and the application of force by federal and local law enforcement in specific situations. In particular, the prohibition against, and the definition of, “excessive” force by police demands attention in the context of NLW.

Next, the Article presents three selected case studies: Waco in Section IV, Moscow in Section V, and Basra in Section VI. Many recent events have provided an altogether too rich assortment of unhappy incidents of collective violence to choose from, but these three repre-

representatives usefully characterize the field. Each of the three confrontations has already been described in the relevant literature; thus, the focus here is not to re-tell each story in lurid detail, but to concentrate on the types of weapons used by police, military, and their opponents. More tellingly, this inquiry asks about the types of weapons that were *not* used in each incident: what might have happened, and how might things have turned out differently, if an additional category of weapons, with a variety of specialized non-lethal effects and attributes, had been available? The point is not simply to critique the beleaguered combatants or to second-guess their choices of negotiating strategies, political positions, or assault tactics. Instead, this Article poses the hypothetical inquiry about whether NLW could have played a useful contributing role in saving lives and accomplishing missions.

Section VII then sounds a necessary cautionary note, recounting some of the many critiques of the nascent movement to embrace non-lethal weapons and exploring a miscellany of arguments as to why the United States and other governments might still hesitate to go wholeheartedly down this procurement pathway. Even if one believes that NLW could have made a positive contribution to a more peaceful resolution of the three selected case studies, there are counterbalancing considerations. Prominent among these concerns are the danger of proliferation of the weaponry—to opposing military forces, to criminals, to human rights abusers—and the release of existing inhibitions against too-adventurous applications of governmental force.

Finally, Section VIII offers some recommendations and conclusions, boiling down to a cautious “green light” for NLW development programs. There are good reasons to be hopeful that emerging non-lethal technologies can liberate police and military forces from their existing dilemma; if the military or police have only the ability to over-react or to under-react, then they cannot do a very good job of promoting law, order, and security. If sticky foam, acoustic rays, tasers, vehicle nets, and other esoteric devices could enable military and law enforcement authorities to behave with a more deft touch, complementing existing firepower with an enriched range of possibilities, this would be a most welcome boon. But international and domestic law restraints, and prudent projections about how other actors might respond to the U.S. articulation of new NLW capabilities, mandate a reflective, step-by-step approach. Indeed, non-lethal weapons might be helpful in some categories of important, challenging, and all-too-frequent confrontations, but such weapons are no panacea.

LETHAL AND NON-LETHAL WEAPONS

II. THE WORLD OF NON-LETHAL WEAPONS

A. Defining “Non-Lethal”

What does the term “non-lethal” weapons mean? A variety of definitions has been proffered, the most visible of which comes from the U.S. Department of Defense (DoD), where the U.S. Marine Corps houses the Joint Non-Lethal Weapons Directorate (JNLWD), the leading military arm in research, development, and procurement in the field. As specified in the definition section of DoD Directive 3000.3:

3.1. Non-Lethal Weapons. Weapons that are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment.

3.1.1. Unlike conventional lethal weapons that destroy their targets principally through blast, penetration and fragmentation, non-lethal weapons employ means other than gross physical destruction to prevent the target from functioning.

3.1.2. Non-lethal weapons are intended to have one, or both, of the following characteristics:

3.1.2.1. They have relatively reversible effects on personnel or materiel.

3.1.2.2. They affect objects differently within their area of influence.¹

In partial contrast, the National Institute of Justice, which orchestrates the U.S. Department of Justice’s exploratory programs in the field, articulates the objective as the “identification and development of new or improved weapons and other technology that will minimize the risk of death and injury to officers, suspects, prisoners and the public, and contribute to the reduction of civil and criminal liability suits against police, sheriff, and corrections departments.”²

Other experts have promulgated rival definitions with varying de-

1. U.S. Dep’t of Defense, Directive No. 3000.3: Policy for Non-Lethal Weapons (July 9, 1996) [hereinafter DoD Directive No. 3000.3], available at <http://www.dtic.mil/whs/directives/corres/html/30003.htm>.

2. Lois Pilant, *Crime and War: An Analysis of Non-Lethal Technologies and Weapons Development*, POLICE CHIEF, June 1998, at 55 (quoting the National Institute of Justice).

degrees of formality and inclusiveness.³ NATO, for example, formally refers to the area as “weapons which are explicitly designed and developed to incapacitate or repel personnel, with a low probability of fatality or permanent injury, or to disable equipment with minimal undesired damage or impact on the environment.”⁴

For purposes of this Article, it is useful to supplement these working definitions by differentiating more precisely between anti-personnel and anti-materiel NLW. Anti-personnel NLW are weapons designed and used to have relatively temporary effects, which disappear either simply via the passage of time or via the administration of relatively minor treatment. Anti-materiel NLW are designed and used either: a) to have relatively temporary effects, which disappear either simply via the passage of time or via the administration of relatively minor treatment; or b) to destroy a target via non-explosive means.⁵

3. See NICK LEWER & STEVEN SCHOFIELD, *NON-LETHAL WEAPONS: A FATAL ATTRACTION?: MILITARY STRATEGIES AND TECHNOLOGIES FOR 21ST-CENTURY CONFLICT* 6-7 (1997) (noting three slightly different definitions of NLW from different authors). The Human Effects Advisory Panel established by the JNLWD has proposed a quantitative definition, under which a weapon would be classified as non-lethal if it incapacitates 98% of the people it is used against, while killing no more than 1/2%, permanently injuring no more than 1/2%, and having no effect on 1%. David P. Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, 21 MICH. J. INT’L L. 51, 62 (1999) [hereinafter Fidler, *The International Legal Implications of “Non-Lethal” Weapons*]; see also James C. Duncan, *Non-Lethal Weapons: Tools Which Expand the Commander’s Use of Force Options*, J. COUNTERTERRORISM & SECURITY INT’L, Fall 1999, at 16-18 (noting that almost every definition of non-lethal weapons features two elements: the physical capability of these weapons not to permanently kill, injure or destroy property, and their potential application to the entire spectrum of traditional military operations as well as to diplomatic matters).

4. Press Statement, NATO, NATO Policy on Non-Lethal Weapons ¶ 3 (Oct. 13, 1999) [hereinafter NATO Policy on Non-Lethal Weapons], available at <http://www.nato.int/docu/pr/1999/p99103e.htm>.

5. See generally *A Joint Concept for Non-Lethal Weapons: Guidance for Non-Lethal Weapons Development*, MARINE CORPS GAZETTE, Mar. 1998, at A6 [hereinafter *Joint Concept*] (reversibility of anti-personnel non-lethal weapons that cause “temporary disorientation, passivity, pain, or loss of consciousness,” that would be reversible with the passage of “a few minutes to a few hours” or the administration of a pharmaceutical or antidote).

As elaborated *infra*, these definitions bring within the embrace of NLW weapons that are either: (1) temporary (in allowing the targeted person or object to return to ordinary functioning relatively quickly); or (2) stealthy (in permanently destroying an object via mechanisms that are relatively precise and quiet). For present purposes, this Article dispenses with potential NLW (e.g., specialized chemical or biological weapons) that might be designed specifically to target plants or animals.

Various authorities organize the NLW field in different ways. For some, the weapons concepts are best organized under five capabilities: anti-personnel, anti-materiel, anti-mobility, anti-infrastructure, and area-denial. For present purposes, the two categories of anti-personnel and anti-materiel suffice.

LETHAL AND NON-LETHAL WEAPONS

It is important to note that none of these definitions includes any complete assurance against lethal effects of the weaponry.⁶ The effort is to *reduce* the probability of mortality, but not necessarily to negate it altogether. In any application of organized violence, especially one undertaken in such a wide variety of environments and contexts, against people of diverse health histories, strengths, and weaknesses, there is some inherent, irreducible danger of fatalities. A projectile, chemical, or other mechanism that would merely disable or temporarily incapacitate one person (e.g., a young, healthy soldier in the open air) might well inflict mortal injury on another (e.g., a child in a

This Article follows the literature's convention of excluding from the current discussion consideration of a variety of other weapons, tactics, and programs that would typically be "non-lethal," at least in their initial effects, but that raise so many *sui generis* problems of their own that separate analysis is warranted. *Joint Concept, supra*, at A1; Joseph W. Siniscalchi, *Nonlethal Technologies and Military Strategy*, in *THE TECHNOLOGICAL ARSENAL: EMERGING DEFENSE CAPABILITIES* 129, 131 (William C. Martel ed., 2001). Among these important topics—related to, but different from, the NLW described here—are computer warfare, psychological operations, robotics, nanotechnology, precision guidance, and advanced sensor systems. For a discussion of some of those elusive topics, see U.S. Dep't of Defense, Office of General Counsel, *An Assessment of International Legal Issues in Information Operations* (May 1999) (computer operations), available at <http://downloads.securityfocus.com/library/infowar/reports/dodio.pdf>; Robert D. Pinson, *Is Nanotechnology Prohibited by the Biological and Chemical Weapons Conventions?*, 22 *BERKELEY J. INT'L L.* 279 (2004) (nanotechnology); NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES, *AN ASSESSMENT OF NON-LETHAL WEAPONS SCIENCE AND TECHNOLOGY* (2003) (sensor technology) [hereinafter NATIONAL RESEARCH COUNCIL].

6. DoD Directive No. 3000.3, *supra* note 1, § 4.6; *Joint Concept, supra* note 5, at A1; Siniscalchi, *supra* note 5, at 131; NATO Policy on Non-Lethal Weapons, *supra* note 4.

Some of the early literature breathlessly foresaw NLW promising "bloodless war," with these allegedly "harmless weapons" enabling the superior force to prevail in combat without inflicting casualties on either combatants or civilians. See, e.g., COUNCIL FOR SCIENCE AND SOCIETY, *HARMLESS WEAPONS* (1978); ALVIN TOFFLER & HEIDI TOFFLER, *WAR AND ANTI-WAR: SURVIVAL AT THE DAWN OF THE 21ST CENTURY* 125-36 (1993). This unrealistic expectation has now dropped out of the NLW concept. Siniscalchi, *supra* note 5, at 130, 149; JOHN B. ALEXANDER, *FUTURE WAR: NON-LETHAL WEAPONS IN 21ST CENTURY WARFARE* 184 (1999) [hereinafter *FUTURE WAR*].

It is also noteworthy that proponents of NLW tend to overlook what might be termed "second order" or "indirect" injuries and fatalities associated with the weaponry. That is, if a non-lethal device were to stun or disorient a person, or cause her to lose traction or balance, so she fell down, the initial incident or impact might cause only a relatively minor injury; but if, in falling, she hit her head on the ground or some other object, a more serious danger could arise. On a larger scale, if a non-lethal weapon were to disrupt, even temporarily, a targeted region's electricity supply, it is likely that hospitals and water treatment plants would be affected as well as military bases, resulting in predictable deaths. See U.S. JOINT CHIEFS OF STAFF, *JOINT PUBLICATION 3-60, JOINT DOCTRINE FOR TARGETING I-7* (2002) ("Sound planning should allow for consideration of the risks of unintended second- and third-order consequences.").

confined space or an elderly person already compromised by illness).⁷

Many observers, therefore, regard the very term “non-lethal weapon” as an oxymoron and have substituted alternative vocabularies.⁸ They would refer to the topic as embracing weapons that are “sub-lethal,” “less lethal,” “less than lethal,” “disabling,” or that accomplish a “soft kill” or a “mission kill.”⁹ For similar reasons, the International Committee of the Red Cross and some other authors, when referring to this

7. INDEP. TASK FORCE, COUNCIL ON FOREIGN RELATIONS, NON-LETHAL TECHNOLOGIES: MILITARY OPTIONS AND IMPLICATIONS 2 (1995) [hereinafter CFR TASK FORCE 1] (“There is no sharp division, but rather a continuum, between non-lethal weapons and precision-directed lethal weapons.”).

Realistically, the opposite pole of the spectrum of lethality is also merely a matter of probability: even the most “lethal” of traditional weapons are fatal in only a fraction of their applications. Battlefield statistics indicate that Kalashnikov rifles, for example, kill only 20% of the soldiers they injure, and hand grenade injuries are fatal only 10% of the time. Robin M. Coupland, “Calmatives” and “Incapacitants”: Questions for International Humanitarian Law Brought by New Means and Methods of Warfare with New Effects? 2 (Apr. 26-27, 2003) (presented at The 19th Workshop of the Pugwash Study Group on the Implementation of the Chemical and Biological Weapons Conventions, on file with the Georgetown Journal of International Law); Robin M. Coupland & David Meddings, *Mortality Associated with Use of Weapons in Armed Conflicts, Wartime Atrocities, and Civilian Mass Shootings: Literature Review*, 319 BRIT. MED. J. 386, 407-08 (1999) (reporting that in conflicts during and after World War II, deaths in combat never exceeded 26% of all battle casualties).

Assessment of the effects of candidate NLW technologies upon human beings is a major part of the weapon development process, and the Joint Directorate and the individual U.S. military services have instituted elaborate procedures for vetting the health impact of new concepts, including establishing a Human Effects Process Action Team, a Human Effects Review Board, a Human Effects Center of Excellence, and a Human Effects Advisory Panel. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 38-41, 44-45, 77-79, 148-65; COUNCIL ON FOREIGN RELATIONS INDEPENDENT TASK FORCE, NONLETHAL TECHNOLOGIES: PROGRESS AND PROSPECTS 33-34 (1999) [hereinafter CFR TASK FORCE 2]; JOINT NON-LETHAL WEAPONS PROGRAM ANNUAL REPORT 28 (2000); Victor Wallace, *Non-Lethal Weapons: R²IPE for Arms Control Measures?*, in THE FUTURE OF NON-LETHAL WEAPONS: TECHNOLOGIES, OPERATIONS, ETHICS AND LAW 141, 153 (Nick Lewer ed., 2002).

8. Even the word “weapon” is at least partially inapposite here, because the notion of NLW also includes a variety of devices such as enhanced barrier systems, sealants, tagants, and other tools that provide an advantage in combat or law enforcement, but do not attack, harm, or capture an enemy force in the way a “weapon” might. *See infra* text accompanying notes 11-69.

9. LEWER & SCHOFIELD, *supra* note 3, at 5-6 (Sometimes, a term such as “pre-lethal” is also applicable, as the non-lethal weapons are used to incapacitate an enemy force, boosting the effectiveness of a subsequent employment of fully lethal force; sometimes, in view of the horrific injuries they may cause, these weapons may be labeled as “worse than lethal.”); James C. Duncan, *A Primer on the Employment of Non-Lethal Weapons*, 45 NAVAL L. REV. 1, 5 n.13 (1998); FUTURE WAR, *supra* note 6, at 17. The Department of Justice has traditionally referred to this topic as the investigation of “less than lethal” systems, while the Department of Defense has adopted “non-lethal.” David G. Boyd, *The Search for Low Hanging Fruit: Recent Developments in Non-Lethal Technologies*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS § 5 (Malcolm Dando ed., Nov. 2000).

LETHAL AND NON-LETHAL WEAPONS

entire category of ordnance, routinely place the term “non-lethal weapons” inside quotation marks or use a phrase like “so-called non-lethal weapons.”¹⁰

While acknowledging the somewhat misleading connotation of the term, this Article will follow the mainstream of the literature and employ the term “non-lethal” (ordinarily without quotation marks). For better or worse, this is the language that has established itself as the leading expression and, lacking an obviously-better alternative, it remains a plausible form of reference.

B. *Traditional Forms of Non-Lethal Weapons*

The concept of a non-lethal weapon is hardly a recent creation. Indeed, a variety of NLW have been staples in the inventories of armies—and especially of police—around the world for decades. Among the most familiar low-technology devices for crowd control have been truncheons, water cannon, K-9 corps, and cattle prods.¹¹ One step higher on the ladder of escalation have been rubber or plastic bullets, or, more generally, firearms that utilize projectiles that inflict a blunt trauma upon the target, without intending to penetrate the skin or inflict fatal wounds, such as aerodynamic beanbags or plastic batons.¹² A different approach comes from the world of chemistry: law enforcement officials in the United States, the United Kingdom, and many other countries have employed sequential generations of tear gas or other noxious vapors, designated CN, CS, or Mace.¹³

These devices and tactics proliferated around the world, frequently demonstrating at least partial tactical successes. In many instances, police use of these limited, albeit crude, measures aided in breaking up a crowd, isolating the most determined opponents, and deterring the

10. See, e.g., Coupland, *supra* note 7, at 2; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 60 (asserting that “the term ‘non-lethal’ persists not because more accurate terms cannot be found but because it is easier for the military to market ‘non-lethal’ weapons in military and civilian contexts”).

11. Joseph F. Coates, *Nonlethal Weapons for Domestic Law Enforcement Officers*, in LAW ENFORCEMENT SCIENCE AND TECHNOLOGY 787-97 (S.A. Yefsky ed., 1967). See generally REX APPLGATE, RIOT CONTROL-MATERIEL AND TECHNIQUES (1969); ANTHONY DEANE-DRUMMOND, RIOT CONTROL (1975).

12. FUTURE WAR, *supra* note 6, at 88-94. Kinetic energy munitions were among the first NLW; they rely upon relatively short-range general purpose or specially-designed firearms to propel rubber, plastic, or wooden projectiles that stun, confuse, or frighten people without inflicting death or permanent injury. Grenades, land mines, and other weapons can also be adapted to fire non-lethal projectiles, such as clusters of rubber balls or sponges. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 24-26.

13. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 26-28, 60-61.

more faint of heart. In several turbulent settings, authorities succeeded in protecting property, fracturing an illegal demonstration, apprehending ringleaders, and avoiding further incitement of the populace.¹⁴

But these immature mechanisms were burdened with important defects and limitations. Many operated only at short range—for example, a police officer would have to come within arm’s length of the offender to strike with a nightstick—and that proximity could be hazardous in situations where the police might be outnumbered.¹⁵ Some of the devices were unreliable (the electric charge in a cattle prod might fail or might be insufficient to alter the target’s behavior) or subject to available countermeasures (crowds could avoid water cannon, or outmaneuver or outlast the vehicles transporting it).¹⁶ Chemical sprays could be dissipated by adverse weather—rain degrades some chemicals very quickly—and a capricious wind could turn the gas back onto the police themselves.¹⁷ Importantly, these devices were sometimes *not* non-lethal; deaths from plastic bullets, for example, were not uncommon, as a projectile might strike a particularly vulnerable person, might hit someone at a closer range than anticipated, or might impact a sensitive body part.¹⁸ Of course, public reaction to these displays of force was frequently adverse; police sometimes seemed to

14. For example, over the past three decades the British Army in Northern Ireland has employed—not without controversy—a wide array of NLW for purposes of crowd and riot control, including tear gas, rubber and plastic bullets, and water cannons. Several hundred injuries have been reported due to these devices over the years, and 17 deaths have resulted since 1970 (though no deaths since 1994). NATIONAL RESEARCH COUNCIL, *supra* note 5, at 59-60; FUTURE WAR, *supra* note 6, at 89-92; Colin Burrows, *Operationalizing Non-Lethality: A Northern Ireland Perspective*, in THE FUTURE OF NON-LETHAL WEAPONS: TECHNOLOGIES, OPERATIONS, ETHICS AND LAW, *supra* note 7, at 99, 103; LEWER & SCHOFIELD, *supra* note 3, at 59-77 (also describing U.S. use of chemicals in Vietnam and other NLW case studies).

15. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 34 (“By their nature, non-lethal weapons technologies often have limited range and some variation in effects.”).

16. CAROL ACKROYD ET AL., THE TECHNOLOGY OF POLITICAL CONTROL 205-07 (2d ed. 1980) (tactical drawbacks of water cannon).

17. Siniscalchi, *supra* note 5, at 132 (identifying four problems with chemical NLW: (1) the availability of protective equipment to blunt its effects; (2) the possibility that rain or wind would limit its effective radius; (3) the unpredictability of its effects upon any particular person; and (4) the treaties that constrain its use).

18. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 25 (also noting efforts to develop a rifle system with an adjustable muzzle velocity, allowing the shooter to modulate the speed of the NLW munition depending upon the range to the target, which could reduce serious injuries); *A New Police Rifle Programmed to Fire Bullets at Different Speeds*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, at app. D (reporting on a variable speed rifle, capable of controlling the velocity of the projectile, which accommodates use against targets at different ranges); Charles Heal, *The Quest for the ‘Magic Bullet,’* in NON-LETHAL WEAPONS: TECHNOLOGICAL AND

LETHAL AND NON-LETHAL WEAPONS

create additional enemies and damage their own reputations, even when they were sincerely attempting to modulate their application of restrained power.¹⁹

C. Modern Non-Lethal Weapons Concepts

The turn of the century has ushered in a dramatically new era of NLW; a bewildering array of unforeseen capabilities is now set to spill out of laboratories and test sites.²⁰ The literature on NLW has likewise mushroomed, including contributions from a wide range of disciplines, such as public policy,²¹ medicine,²² popular culture,²³ military science,²⁴ and law.²⁵ Both U.S.²⁶ and international²⁷ authorities, espe-

OPERATIONAL PROSPECTS, *supra* note 9, § 4.5 (NLW projectiles of various design are generally inaccurate and far less than 100% effective).

19. The public reaction to governmental uses of force can be quite important, and quite adverse—and has gained even more weight in the “CNN era,” when television cameras immediately broadcast evocative images to the entire world. *Joint Concept*, *supra* note 5, at A2. Most recently, the displays of snarling dogs, threatening prisoners at the Abu Ghraib camp in Iraq, shamed the American military and intelligence personnel who had used that form of NLW to intimidate and humiliate their prisoners. See, e.g., JAMES R. SCHLESINGER, FINAL REPORT OF THE INDEPENDENT PANEL TO REVIEW DoD DETENTION OPERATIONS (Aug. 2004) [hereinafter DoD INDEPENDENT PANEL REPORT], available at <http://www.dod.mil/news/Aug2004/d20040824finalreport.pdf>; Josh White & Thomas E. Ricks, *Iraqi Teens Abused at Abu Ghraib*, *Report Finds*, WASH. POST, Aug. 24, 2004, at A1.

20. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 40-44 (listing “legacy programs” and the “technology investment program” activities of the Joint Non-Lethal Weapons Directorate as a sampling of the ongoing activity in the field); Duncan, *supra* note 9, at 13-21 (describing three categories of NLW, with dozens of examples); LEWER & SCHOFIELD, *supra* note 3, at 33-43 (recounting evolution of the U.S. Government’s NLW research and development programs).

21. The Council on Foreign Relations has sponsored three independent task forces to analyze non-lethal weapons and make recommendations for future actions. See CFR TASK FORCE 1, *supra* note 7; CFR TASK FORCE 2, *supra* note 7; COUNCIL ON FOREIGN RELATIONS INDEPENDENT TASK FORCE, NONLETHAL WEAPONS AND CAPABILITIES (2004) [hereinafter CFR TASK FORCE 3]. The author was a member of the third task force. Other public policy organizations such as the Sunshine Project and the Federation of American Scientists have focused attention on selected NLW options, bringing to public attention a variety of important documents and analyses. See <http://www.sunshine-project.org>; <http://www.brad.ac.uk/acad/nlw>.

22. See, e.g., Jean-Paul Yih, *CS Gas Injury to the Eye*, BRIT. MED. J., July 29, 1995, at 276; “Safety” of *Chemical Batons*, 352 THE LANCET 159 (1998); James S. Ketchum & Frederick R. Sidell, *Incapacitating Agents*, in MEDICAL ASPECTS OF CHEMICAL AND BIOLOGICAL WARFARE 287-306 (Frederick R. Sidell et al. eds., 1997).

23. See, e.g., Eric Adams, *Shoot to Not Kill*, POPULAR SCI., May 2003, at 88; John Barry & Tom Morganthau, *Soon*, “*Phasers on Stun*,” NEWSWEEK, Feb. 7, 1994, at 24; Stephen Mihm, *The Quest for the Nonkiller App*, N.Y. TIMES MAG., July 25, 2004, at 38.

24. See, e.g., Timothy J. Lamb, *Emerging Nonlethal Weapons Technology and Strategic Policy Implications for 21st Century Warfare*, MILITARY POLICE, Apr. 2003, at 6-9; Robert Mandel, *Nonlethal*

cially British,²⁸ are engaged, and a variety of academic²⁹ and commer-

Weaponry and Post-Cold War Deterrence, 30 ARMED FORCES & SOCIETY 511, 511-37 (2004); *Civil Disturbances: Incorporating Non-Lethal Technology: Tactics, Techniques and Procedures*, Newsletter 00-7 (U.S. Army, Center for Army Lessons Learned, Fort Leavenworth, Kan.), Apr. 2000, at ch. 4, available at http://www.globalsecurity.org/military/library/report/call/call_00-7_ch4.htm; Robert T. Durkin, *The Operational Use of Non-Lethal Weapons* (Feb. 8, 2000) (unpublished paper, Naval War College, on file with the Georgetown Journal of International Law); W.M. Callihan, *Non-Lethal Weapons in Conventional Combat Operations: Leveraging Capabilities or Violating the Rules of War?* (May 17, 1999) (unpublished paper, Naval War College, on file with the Georgetown Journal of International Law).

25. See, e.g., Duncan, *supra* note 9; Burrus M. Carnahan, *Unnecessary Suffering, The Red Cross and Tactical Laser Weapons*, 18 LOY. L.A. INT'L & COMP. L. REV. 705, 705-32 (1996); Fidler, *The International Legal Implications of "Non-Lethal" Weapons*, *supra* note 3; Neal Miller, *Less-Than-Lethal Force Weaponry: Law Enforcement and Correctional Agency Civil Law Liability for the Use of Excessive Force*, 28 CREIGHTON L. REV. 733, 733-94 (1995); W. Hays Parks, *Air War and the Law of War*, 32 A.F. L. REV. 1, 1-225 (1990); Vincent Sautenet, *Legal Issues Concerning Military Use of Non-Lethal Weapons*, 7 MURDOCH U. ELECTRONIC J.L. 8, June 2000, at <http://www.murdoch.edu.au/elaw/issues/v7n2/sautenet72.html>.

26. See, e.g., Lynn Klotz et al., *Beware the Siren's Song: Why "Non-Lethal" Incapacitating Chemical Agents Are Lethal*, FED'N OF AM. SCIENTISTS, Mar. 2003; Mark Wheelis, *Biotechnology and Biochemical Weapons*, NONPROLIFERATION REV., Spring 2002, at 48-53; Mark Wheelis, "Nonlethal" Chemical Weapons: A Faustian Bargain, ISSUES SCI. & TECH., Spring 2003, at 74.

27. See, e.g., Coupland, *supra* note 7; Robin M. Coupland, "Non-lethal" Weapons: Precipitating a New Arms Race, 315 BRIT. MED. J. 72 (1997) (editorial); Isabelle Daoust et al., *New Wars, New Weapons? The Obligation of States to Assess the Legality of Means and Methods of Warfare*, 84 INT'L REV. RED CROSS 345 (2002); Friedhelm Kruger-Sprengel, *Non-Lethal Weapons: A Humanitarian Perspective in Modern Conflict*, 42 MILITARY L. & L. WAR REV. 357, 359 (2003).

28. See, e.g., MALCOLM DANDO, A NEW FORM OF WARFARE: THE RISE OF NON-LETHAL WEAPONS (1996); LEWER & SCHOFIELD, *supra* note 3; Malcolm R. Dando, *Strengthening the Chemical Weapons Convention, The Danger to the Chemical Weapons Convention from Incapacitating Chemicals*, FIRST CWC REVIEW CONFERENCE PAPER No. 4 (Mar. 2003); Nick Lewer et al., *The Future of Non-Lethal Weapons*, 17 MED. CONFLICT & SURVIVAL 180, 180-93 (2001); Nick Lewer, *Research Report No. 1*, BRADFORD NON-LETHAL WEAPONS RESEARCH PROJECT (BNLWRP) (Ctr. for Conflict Resolution, Dep't of Peace Studies, U. of Bradford, U.K.), Nov. 1997, available at http://www.brad.ac.uk/acad/nlw/research_reports/researchreport1.php; Nick Lewer, *Research Report No. 2*, BRADFORD NON-LETHAL WEAPONS RESEARCH PROJECT (BNLWRP) (Ctr. for Conflict Resolution, Dep't of Peace Studies, U. of Bradford, U.K.), June 1998, available at http://www.bradford.ac.uk/acad/nlw/research_reports/researchreport2.php; Tobias Feakin, *Research Report No. 3*, BRADFORD NON-LETHAL WEAPONS RESEARCH PROJECT (BNLWRP) (Ctr. for Conflict Resolution, Dep't of Peace Studies, U. of Bradford, U.K.), Aug. 2001, available at http://www.brad.ac.uk/acad/nlw/research_reports/researchreport3.php.

29. See, e.g., Institute for Non-lethal Defense Technology, Applied Research Laboratory at Pennsylvania State University, at <http://nldt2.arl.psu.edu/homepage.php>; Nonlethal Environmental Evaluation and Remediation Center, Kansas State University, at <http://www.engg.ksu.edu/NEER/nonlethal/>; Non-lethal Technology Innovation Center, University of New Hampshire, at <http://www.unh.edu/ntic>; NATIONAL RESEARCH COUNCIL, *supra* note 5, at 44 (noting Non-Lethal

LETHAL AND NON-LETHAL WEAPONS

cial NLW activities³⁰ have captured the imagination. The U.S. Government has started to devote significant funds to the area,³¹ and U.S. NATO allies are being brought to the topic as well,³² despite criticisms that progress has not been as rapid as promised.³³

Some of the new NLW advances are sequential improvements on existing concepts, incrementally upgrading the current arsenal. Others augur entirely new technologies, never before seen on the battlefield or the streets.³⁴ A few have already been tried and found wanting; insurmountable (at least for now) technical problems make them infeasible or unattractive. Many NLW advances are still in development and may similarly fail to meet the complete set of design criteria and operational desiderata.³⁵ Others, however, have already been deployed

Technology Innovation Center at the University of New Hampshire and the U.S. Marine Corps' Small Business Innovation Research Program).

30. See NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, at Introduction (noting four international conferences on NLW sponsored by Jane's Information Group starting in 1997).

31. Because many NLW development programs are classified, it is impossible to track the U.S. Government's entire annual spending on non-lethal weapons. One crude, partial indicator is the budget of the Joint Directorate, which oversees certain multi-service research and development programs. This account has grown from \$9.3 million in FY 1997 to \$28.1 million in FY 2001 to \$43.4 million in FY 2004, with a projected budget of \$45.7 million in FY 2009. CFR TASK FORCE 3, *supra* note 21, at 16; see also CFR TASK FORCE 2, *supra* note 7, at 28-29.

32. NATO Policy on Non-Lethal Weapons, *supra* note 4; European Working Group, *Non-Lethal Weapons, 2nd European Symposium on Non-Lethal Weapons* (Feb. 2, 2003), at <http://www.non-lethal-weapons.com/sy02index.html#main>.

33. See, e.g., CFR TASK FORCE 3, *supra* note 21, at 8 ("We found little evidence that the value and transformational applications of nonlethal weapons across the spectrum of conflict are appreciated by the senior leadership of the Department of Defense. Despite successes on the small scale, NLW have not entered the mainstream of defense thinking and procurement."); CFR TASK FORCE 2, *supra* note 7, at viii; CFR TASK FORCE 1, *supra* note 7, at 10-12. In the words of U.S. Marine General John Sheehan, NLW "will always be tomorrow's weapons unless we move now. We need to pull them from the laboratories and place them in operational units." Duncan, *supra* note 9, at 56.

34. Gwen Shaffer, *Force Multiplier*, NEW REPUBLIC, Aug. 2, 2004, at 19. One of the most desirable characteristics of the new generation of weaponry would be a "rheostatic" feature, giving the user the option to switch quickly and easily between lethal and non-lethal applications. For example, a dual-capable rifle with two barrels and two ammunition supplies might enable the user to toggle between a conventional deadly round and a NLW payload carrying a stinger or dose of riot control chemicals. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 21; *Joint Concept*, *supra* note 5, at A4-A5; Mihm, *supra* note 23.

35. Non-lethal weapons, as any other proposed new arms, would have to satisfy the user on a variety of performance characteristics. No matter how promising the innovation might otherwise be, it will not be adopted if it is too expensive, cumbersome to transport or use, difficult to maintain or repair, demanding of training, susceptible to countermeasures, dangerous to the

to troops in the field or held in reserve for emergencies.³⁶ This Section cannot undertake to survey all of the NLW technologies in various stages of development.³⁷ But the Section does introduce a sampling of the most salient NLW technologies, describing a few of the emerging systems, ranging from the increasingly familiar to the “gee wiz.”

Sticky foam and slippery foam. Among the earliest modern NLW concepts that fleetingly grabbed public attention in the 1990s were sticky foam and slippery foam. The former would be expelled, like a high-pressure aerosol, from a backpack tank worn by a soldier or police officer. The sticky foam might reach a range of 10 yards or so and would douse a targeted person with a moist spray, which would quickly harden to a styrofoam-like rigidity. Once so ensnared, the target could not run away, could not maintain aggressive actions, and could not effectively resist police arrest.³⁸

Slippery foam would be similarly sprayed from a tank or ejected from

user, etc. DoD Directive No. 3000.3, *supra* note 1, § 5.6.3-5.6.4; *Joint Concept*, *supra* note 5, at A3-A4; Siniscalchi, *supra* note 5, at 136-37.

36. The most advanced example of new operational military non-lethal arms is the creation and distribution of “nonlethal capability sets,” which comprise fifty-five types of NLW in four different modules, including pepper spray, beanbag rounds, plastic handcuffs, spotlights, and shields. JNLWD distributed these sets to U.S. military units around the world and they were used to good effect in Iraq in 2003 by U.S. Army Quick Reaction Forces that supported small units that found themselves surrounded by hostile crowds. CFR TASK FORCE 3, *supra* note 21, at 13, 18, 28, 49; David P. Karcher, Joint Non-Lethal Weapons Program (Jan. 2003) (slide show, on file with the Georgetown Journal of International Law).

37. For descriptions of the array of NLW capabilities being studied, developed, or produced for anti-personnel, anti-materiel, and anti-capability functions, see JOINT NON-LETHAL WEAPONS PROGRAM ANNUAL REPORT, *supra* note 7; NATIONAL RESEARCH COUNCIL, *supra* note 5, at 23-72, 120-47; FUTURE WAR, *supra* note 6, at 222-25; Rennie Campbell, *Product and Producer Information*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, app. C; Duncan, *supra* note 9; Jorma Jussila, *Future Police Operations and Non-Lethal Weapons*, in THE FUTURE OF NON-LETHAL WEAPONS: TECHNOLOGIES, OPERATIONS, ETHICS AND LAW, *supra* note 7, at 87-98; LEWER & SCHOFIELD, *supra* note 3, at 7-15; Nick Lewer & Tobias Feakin, *Perspectives and Implications for the Proliferation of Non-Lethal Weapons in the Context of Contemporary Conflict, Security Interests and Arms Control*, in THE FUTURE OF NON-LETHAL WEAPONS: TECHNOLOGIES, OPERATIONS, ETHICS AND LAW, *supra* note 7, at 126-40 (identifying three generations of NLW); Siniscalchi, *supra* note 5.

38. FUTURE WAR, *supra* note 6, at 70-71. A related adaptation (anti-materiel, rather than anti-personnel) of similar technology would be non-lethal rigid foam, a polyurethane/epoxy concoction that could be quickly dispensed from a hand-held device to create an impermeable barrier on doors, windows, vehicles, generators, weapons, etc. JOINT NON-LETHAL WEAPONS PROGRAM ANNUAL REPORT, *supra* note 7, at 11; Steven H. Scott, *Sticky Foam as a Less-Than-Lethal Technology*, in PROCEEDINGS OF THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING: SECURITY SYSTEMS AND NONLETHAL TECHNOLOGIES FOR LAW ENFORCEMENT 96 (John B. Alexander et al. eds., 1996); Peter B. Rand, *Foams for Barriers and Non-Lethal Weapons*, *in id.*, at 104.

LETHAL AND NON-LETHAL WEAPONS

a projectile. It would be designed to spread itself to cover a flat surface—for example, a hallway, road, bridge, or runway—with a super-slippery sheen, preventing people from walking or vehicles from driving on it. The prototypes of the “liquid ball bearings” were hundreds of times more slippery than the slickest ice sheets, inspiring the hope that the system could be used, for example, to protect an embassy from an advancing crowd, to foreclose enemy use of a strategic intersection or rail yard without permanently destroying it, or to prevent demonstrators from crossing a coated municipal square.³⁹

Unfortunately, the promise has to date exceeded the reality. Sticky foam lost favor with researchers and has largely been abandoned because the foam was not reliably non-lethal; the substance could cover the target’s nose and mouth, blocking airways.⁴⁰ Slippery foam, which is still being actively investigated, might be negated by simple countermeasures such as throwing sand or dirt onto the coated surface, quickly and cheaply restoring the attackers’ traction.

Electric guns. Instead of a gun firing lethal (or sometimes-lethal) projectiles, electricity might be marshaled to stop an attacker. Electric handguns, such as the Taser brand, have become quite popular with law enforcement authorities and, more recently, with the U.S. military.⁴¹ These sidearms typically eject a pair of small darts, trailing very thin wires to a distance of twenty-one feet (a longer range version, to

39. Cf. JOINT NON-LETHAL WEAPONS PROGRAM ANNUAL REPORT, *supra* note 7, at 18.

40. FUTURE WAR, *supra* note 6, at 70-71 (noting that in addition to being potentially lethal, sticky foam is difficult to clean up and requires a bulky recharging unit; nonetheless, it may still prove useful for creating barriers around threatened buildings, even if not for direct anti-personnel use); Boyd, *supra* note 9, § 5.1 (sticky foam required such painstaking cleanup that it was impractical for law enforcement purposes); Margaret-Anne Coppernoll, *The Nonlethal Weapons Debate*, 52 NAVAL WAR C. REV. 112, 119-120 (1999) (noting that freon, which constitutes nearly one-third of sticky foam, is on the list of controlled substances under international and domestic U.S. environmental law because of ozone depletion and is being phased out).

41. Manya A. Brachear, *Chicago Police to Carry Stun Guns; ‘Less Than Lethal’ Tasers on Way to 200 Sergeants*, CHICAGO TRIB., Sept. 12, 2003, at C3; Brian D. Crecente, *Cops Charged Up Over Tasers; Number of Less-Lethal Guns in Patrol Cars to Double by September*, ROCKY MOUNTAIN NEWS, Aug. 29, 2003, at 5A; Beth DeFalco, *Taser Wins \$1.8 Million Stun Gun Contract*, ASSOCIATED PRESS, July 1, 2004 (reporting purchase by U.S. military of 1000 electric stun guns and accessories, following an order of 3,348 taser weapons by foreign military; more than 4500 police forces in forty-nine U.S. states use taser technology, and 700 departments arm all their patrol officers with these devices); Neil Davison & Nick Lewer, *Research Report No. 6*, BRADFORD NON-LETHAL WEAPONS RESEARCH PROJECT (BNLWRP) (Ctr. for Conflict Resolution, Dep’t of Peace Studies, U. of Bradford, U.K.), Oct. 2004, at 21-23 (reporting large orders for taser weapons placed by U.S. military and police departments), available at http://www.brad.ac.uk/acad/nlw/research_reports/docs/BNLWRPResearchReportNo6_Oct04.pdf.

allow engagements at greater standoff distance, is under development). Barbs on the darts attach to the target's skin or clothing, and a brief but powerful electric shock is administered. The electric charge (50,000 volts) causes the target immediately to lose muscle control, fall down, and be unable to resist for five seconds or longer.⁴²

Proponents assert that the charge is highly effective, even against the most determined (or substance-abusing) resisters, yet no permanent injury is inflicted.⁴³ Electric guns are also much more useable in confined spaces, such as inside an aircraft in flight, where use of a conventional bullet would be inadvisable.⁴⁴ Critics, on the other hand, challenge the effectiveness and the safety of the system, noting severe or lasting injuries and several deaths following exposure to Taser power.⁴⁵

Pepper Spray. The search for a more effective, yet safer, chemical means of crowd control has inspired generations of alchemists and inventors. The newly-emerging leading technology employs oleoresin capsicum (OC), derived from natural cayenne pepper plants. Available in spray cans that project to a distance of twelve feet or more, OC has

42. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 32-33; CFR TASK FORCE 3, *supra* note 21, at 27 (speculating about extending the taser's range to 100 feet); Campbell, *supra* note 37, at app. C; Sarah Kershaw, *As Shocks Replace Police Bullets, Deaths Drop but Questions Arise*, N.Y. TIMES, Mar. 7, 2004, at A1; Davison & Lewer, *supra* note 41, at 29-30 (describing development efforts for a wireless electrical weapon).

43. See ANTHONY BLEETMAN & RICHARD STEYN, THE ADVANCED TASER: A MEDICAL REVIEW (Apr. 27, 2003), available at <http://www.taser.com.documents.tasersubmit.pdf>; Darren Laur, *Taser Technology Research Paper*, Canadian Police Research Centre, Technical Report 01-2000, Sept. 2000, available at <http://www.cprc.org/tr/tr-2000-01.pdf>. See generally Taser International, at <http://www.taser.com/>.

44. See Press Release, Taser International, Korean Airlines Selects Advanced Taser for Use on All Aircraft (Mar. 27, 2002); Press Release, Taser International, United Airlines and Mesa Airlines Apply to Transportation Security Administration to Use Advanced Taser M26 for In-Flight Aircraft Security (Jan. 21, 2003); Press Release, Taser International, Taser International, Inc. Commends Greek Police Special Forces on Use of Advanced Taser M26 to Arrest Turkish Airlines Flight 160 Hijacker (Apr. 1, 2003).

45. Eric M. Koscove, *The Taser Weapon: A New Emergency Medicine Problem*, 14 ANNALS EMERGENCY MED. 1205, 1205-06 (1985); Ronald N. Kornblum & Sara K. Reddy, *Effects of the Taser in Fatalities Involving Police Confrontation*, 36 J. FORENSIC SCI. 434 (1991); James Campbell, *Taser Guns May Be an Alternative, but Not a Panacea*, HOUSTON CHRON., July 12, 2004, at B9; Alex Berenson, *As Police Use of Tasers Soars, Questions over Safety Emerge*, N.Y. TIMES, July 18, 2004, at A1 (noting fifty deaths following taser shocking); Eric M. Weiss, *Va. Man Dies After Battle with Officers*, WASH. POST, Aug. 18, 2004, at B3 (suspect continued to resist police officers even after they repeatedly sprayed him with pepper spray, shocked him with a taser until his hair caught on fire, and shot him with a .40 caliber handgun); see Raymond M. Fish & Leslie A. Geddes, *Effects of Stun Guns and Tasers*, 358 THE LANCET 687 (2001).

LETHAL AND NON-LETHAL WEAPONS

already earned such a reputation for effectiveness that it has very largely displaced earlier CS and CN (mace) chemical sprays in the United States. Vendors and advocates contend that pepper spray acts much more quickly (a two-second burst can inflame the eyes, nose, throat, and lungs, causing temporary blindness and shortness of breath for fifteen to sixty minutes) and that it will safely incapacitate even individuals who are under the influence of alcohol or drugs and beyond the reach of other chemicals.⁴⁶ Again, critics contest: (1) the effectiveness of the substance, asserting that a substantial percentage of people are not restrained by it; (2) its safety, noting deaths associated with OC use; and (3) its propensity for inappropriate use, such as application against individuals who are already under restraint.⁴⁷

Acoustic rays. One of the most evocative early NLW candidate technologies was a concept for an acoustic ray. This tool would have emitted inaudible, invisible sound waves—perhaps from a parabolic dish mounted on top of a jeep or Humvee that also carried the power source—to a distance of approximately 100 yards. The infrasound waves would penetrate the target's body, disrupting internal organs (stomach, lungs, etc.) with unfamiliar harmonics, inducing uncontrollable nausea. The victim would have no choice but to retreat or to fall down with paralyzing sickness, which would ebb once the originating wave source was removed. The acoustic waves would propagate efficiently even through dust, fog, or smoke. Early tests validated the principle that targets were rendered unfit for combat or any other concerted action, but developers to date have been unable to craft a

46. Boyd, *supra* note 9, § 5.4 (calling OC “the less-than-lethal weapon of choice for US police”); Pepper Spray, Inc., at <http://www.peppersprayinc.com/>; Association of Defensive Spray Manufacturers, at <http://pepperspray.org>; Jami Onnen, *Oleoresin Capsicum*, INT’L ASS’N CHIEFS POLICE, June 1993, available at http://www.zarc.com/english/cap-stun/tech_info/oc/iacpocreport.html; John Granfield et al., *Pepper Spray and In-Custody Deaths*, INT’L ASS’N CHIEFS POLICE, Mar. 1994, available at http://www.zarc.com/english/other_sprays/reports/iacp_oc_death_1994.html; *Oleoresin Capsicum: Pepper Spray as a Force Alternative*, NAT’L INST. OF JUST. TECH. ASSESSMENT PROGRAM (U.S. Dep’t of Justice, Office of Justice Programs, National Institute of Justice, Wash. D.C.), Mar. 1994, available at <http://www.justnet.org/pdf/files/pepper.pdf>; Craig H. Steffee et al., *Oleoresin Capsicum (Pepper) Spray and “In-Custody Deaths”*, 16 AM. J. FORENSIC MED. & PATHOLOGY 3 (1995); Davison & Lewer, *supra* note 41, at 34-36 (listing recent examples of large-scale use of chemical irritants for crowd control in several countries).

47. See AM. CIVIL LIBERTIES UNION OF S. CAL., PEPPER SPRAY: A MAGIC BULLET UNDER SCRUTINY (1993); AM. CIVIL LIBERTIES UNION OF S. CAL., PEPPER SPRAY UPDATE: MORE FATALITIES, MORE QUESTIONS (1995); *Black Leaders Urge Pepper Spray Ban*, CHARLOTTE OBSERVER, Nov. 4, 1997, at 4C (between 1990 and 1997, eighty-four people died in police custody after being sprayed with chemicals; some allege a racial pattern in whom police spray with OC); Mark I. Pinsky, *If Pepper Spray Isn’t Lethal, Why All the Deaths?*, L.A. TIMES, June 18, 1995, at A1.

suitably directional device. The acoustic beam fans out from the emitting source, affecting anyone nearby, both friendly and opposing forces.⁴⁸

Directed energy heat ray. Greater success has been earned by a facially similar device that employs millimeter waves instead of acoustic waves. A mobile prototype, denominated “Active Denial System” (ADS) or “Vehicle-Mounted Active Denial System” (VMADS), has been thoroughly tested by the U.S. Air Force Research Laboratory in the New Mexico desert and is approaching the stage of operational deployment. The invisible millimeter wave—effective at the speed of light to a remarkable range of a kilometer or more—stimulates the nerve endings in human skin, but penetrates only 1/64 of an inch. It almost immediately produces a powerful sensation of heat—as if the person were touching a hot light bulb—but does not, in fact, burn the skin or inflict any injury. The targeted person cannot resist the pain—one must involuntarily recoil or avoid the painful stimulus—but the punishment ceases as soon as the person withdraws or the device is aimed elsewhere. The device is effective even through heavy clothing, and the utility of other avoidance tactics (hiding behind a mirror or layers of wet towels, for example) is still being explored. Proponents foresee using the millimeter wave to “clear a space”—to compel a crowd to abandon a contested area—or at least to differentiate between civilians or others who might just be “hangers-on” in a mob versus those more

48. CFR TASK FORCE 3, *supra* note 21, at 25; FUTURE WAR, *supra* note 6, at 95-102; Jurgen Altmann, *Acoustic Weapons: Myths and Reality*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, § 6 [hereinafter Altmann, *Acoustic Weapons*]; Jurgen Altmann, *Non-Lethal Weapons Technologies: The Case for Independent Scientific Analysis*, in THE FUTURE OF NON-LETHAL WEAPONS: TECHNOLOGIES, OPERATIONS, ETHICS AND LAW, *supra* note 7, 117-19 [hereinafter Altmann, *Non-Lethal Weapons Technologies*]. Sound waves, audible or inaudible, could be used directly to inflict pain upon targeted persons, but doing so would jeopardize hearing, possibly resulting in permanent damage. Another concept would seek “acoustic bullets”—high-powered low-frequency blasts—to create an impact wave. The more favored approach now would use inaudible sound waves to disrupt internal organs, causing temporary incapacitation, but this system demands very large amplifiers and speakers, restricting its mobility, has only limited range, and generates more heat than it can dissipate effectively. Some believe that this last approach would be more promising for underwater applications, such as to warn or deter scuba divers who might be approaching a U.S. ship in a port. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 31-32; Siniscalchi, *supra* note 5, at 133. Others promote the concept of long-range audible sound propagation. Press Release, American Technology Corporation, American Technology Reports on Growing Long Range Acoustic Devices (LRAD) Business (Aug. 26, 2004), at http://www.atcsd.com/press_releases.html.

LETHAL AND NON-LETHAL WEAPONS

determined and prepared individuals who may constitute a real threat.⁴⁹ Four to six of the VMADS devices are being mounted onto armored vehicles denominated “Sheriffs” and are planned to be rushed into service in Iraq as early as September 2005, to help scatter crowds and root out insurgent fighters.⁵⁰

Chemical calmatives or malodorants. Additional chemical anti-personnel systems are also under consideration. The “holy grail” for researchers would be a chemical that produced an immediate incapacitating effect, but inflicted no lasting harm, and was safe and effective for the full range of human populations. That goal is likely to continue to prove as elusive as the real holy grail itself.⁵¹ The unavoidable problem is the range of human physiology; a dose that would be just barely sufficient to generate the intended effect on one person would be simultaneously too much for someone else, causing death or lasting injury, and too little for a third person, not sufficing to ensure disability. Even in a closely controlled and monitored setting such as a hospital operating room, the proper amount of anesthetic can vary in dramatic and unpredictable ways. When police or military authorities confront a crowd that includes young, healthy kidnappers and infirm civilians, the proper amount of chemicals to apply becomes hopelessly inexact.⁵²

Nonetheless, a pharmacopia of candidate chemicals is under exploration, including some that “becalm” a targeted person, rendering him or her listless, disoriented, or unconscious,⁵³ and “malodorants,” substances that simply smell so bad that people—other than those pre-

49. U.S. Air Force Research Laboratory, Fact Sheet: Active Denial System—Advanced Concept Technology Demonstration (Feb. 2003) (noting that \$51 million has been invested in the ADS over the past 11 years, \$9 million of which was devoted to human effects testing), *available at* <http://www.de.afrl.af.mil/factsheets/activedenial.html>; CFR TASK FORCE 3, *supra* note 21, at 25; Mihm, *supra* note 23.

50. Tony Freinberg & Sean Rayment, *Microwave Gun to Be Used by US Troops on Iraq Rioters*, LONDON SUNDAY TELEGRAPH, Sept. 19, 2004.

51. For maximum utility, the chemical would also have to be undetectable by the targeted persons, so they would not have an opportunity to respond in any way before the disabling effects occurred. Moreover, the optimal chemical system would enable the user to avoid the effects (such as by wearing protective masks) and would be short in duration, easy to clean up, and without adverse environmental effects.

52. See NATIONAL RESEARCH COUNCIL, *supra* note 5, at 27, 148-65 (examining the relationship between an “effective dose”—which is sufficient to induce the desired effect upon the recipient—and a “lethal dose”—which would prove fatal).

53. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 27 (concluding that “[c]almatives represent a class of chemical substances that offer strong potential as effective NLW”); Boyd, *supra* note 9, § 5.1 (Attorney General’s conference in 1986 recommended devoting most if not all of the

equipped with specialized breathing apparatus—feel compelled to escape.⁵⁴ Again, the utility of these concoctions is hotly debated.⁵⁵

Projectile netting. Non-lethal weapons' capabilities tackle anti-vehicle missions, as well as anti-personnel missions. One of the most vexing cross-cutting demands is the challenge of stopping a fleeing or oncoming person, car, truck, boat, or airplane without inflicting permanent harm. A family of nascent capabilities seeks to employ netting of different composition and strength for these tasks. For example, a small anti-personnel version could be fired from a shotgun-like arm, flying out to ensnare a person in inescapable but non-damaging rope bindings.⁵⁶

A larger, stronger version could tackle the job of stopping a car or truck possibly driven by a terrorist carrying explosives, but also possibly transporting a family of innocent civilians who did not recognize or understand signs and orders to stop. One model, denominated "Portable Vehicle-Arresting Barrier," could be embedded in a roadway near a contested military checkpoint and is portable enough to be transported by police to a highway ahead of a fleeing vehicle. It relies upon ropes and netting to entangle a vehicle's tires and undercarriage and is capable of stopping a 7,500 pound truck traveling at 45 miles per hour within a distance of 200 feet.⁵⁷ Trailing in the development sequence is the "Running Gear Entanglement System," a waterborne mechanism that the Coast Guard, for example, might use to interdict cigarette boats suspected of drug trafficking. If the suspect is fast enough to outrun law enforcement cutters, and the officials are constrained not to employ deadly gunfire in ambiguous circumstances, a neat alternative might be to launch a netting that could capture the target's propellers, forcing the craft to stop for boarding and inspection.⁵⁸

Department of Justice's NLW research funds to the task of developing a suitable anesthetic agent and delivery system).

54. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 26-27 (natural and synthetic malodorants hold promise as devices for repelling people); Heal, *supra* note 18, § 4.5 (maloderants do not incapacitate, but are so offensive that no one can stand to be near the stench); *Israel Devises New 'Smelly' Bomb*, BBC NEWS, Aug. 25, 2004, at http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/middle_east/3598734.stm.

55. *See, e.g.*, FUTURE WAR, *supra* note 6, at 76-80.

56. *Id.* at 82-84.

57. CFR TASK FORCE 3, *supra* note 21, at 18; JOINT NON-LETHAL WEAPONS PROGRAM ANNUAL REPORT, *supra* note 7, at 10.

58. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 33-34, 65-66 (noting that rapid deployment and precision delivery are key obstacles for anti-ship entanglement systems); CFR TASK FORCE 3, *supra* note 21, at 18; *see also* Vivienne Heines, *Shoot to . . . Disable?*, ARMED FORCES J., July 2004, at 23

LETHAL AND NON-LETHAL WEAPONS

Anti-materiel biological and chemical agents. Modern biotechnology and chemistry suggest a variety of other capabilities that might be adapted to police or military NLW missions. Genetically engineered microbes can be imagined—whether they can actually be created on a practical scale is still an open question—to degrade the petroleum in an enemy’s repositories, to corrode rubber tires and gaskets on enemy vehicles, to abrade moving parts, or to perform other similar mischief. A particularly tantalizing image is a metal “embrittlement” agent or other supercaustic chemicals, which hypothetically could be spread surreptitiously by aerosol or liquid onto enemy tanks or other equipment, rendering them, unbeknownst to the enemy, much more fragile and vulnerable in combat.⁵⁹

Again, critics question the feasibility of these devices (could microbiological processes work quickly enough to have a measurable effect on combat), their controllability (might they proliferate beyond the intended target area, befouling our own materiel), and their military value (if our agents could get close enough to enemy forces to deploy these devices, why not simply use ordinary explosives).⁶⁰

Miscellaneous NLW concepts. This abbreviated roster of extant and nascent non-lethal weapons capabilities merely scratches the surface; enthusiasts have compiled inventories of two dozen or more NLW

(describing a new “non-lethal round that can be fired from a 76mm naval gun to disable suspicious boats without endangering their crews”); FUTURE WAR, *supra* note 6, at 83-84; Andrew Koch, *US Coast Guard Goes Gunning for ‘Go-Fasts’*, JANE’S DEF. WKLY., Sept. 22, 1999.

The concept of a non-lethal anti-aircraft mechanism is even more challenging; it is difficult to force a non-cooperative aircraft to land, without incurring a great risk of a catastrophic crash. See FUTURE WAR, *supra* note 6, at 62, 84-85.

59. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 26; Siniscalchi, *supra* note 5, at 134-35; FUTURE WAR, *supra* note 6, at 71-76, 121-22 (almost any substance can be attacked with one chemical or another, although there is no “universal solvent” that could degrade everything); *Disabling Technologies: A Critical Assessment*, JANE’S INT’L DEF. REV., July 1994, at 33.

Note that anti-materiel applications of this sort would not be “temporary” or “reversible” in the sense demanded of anti-personnel NLW (although in some scenarios, perhaps the affected vehicle could be repaired, and parts replaced, more quickly than if it had been struck by a conventional explosive bomb). The notion of “non-lethal” nonetheless applies to these devices that cause catastrophic, permanent damage to targeted equipment, buildings, and other substances, because they operate via unconventional, novel routes, rather than explosions or gross physical deformities. Programs in pursuit of these concepts are therefore within the ambit of the Joint Directorate. DoD Directive 3000.3, *supra* note 1, § 3.1; *Joint Concept*, *supra* note 5, at A6.

60. Altmann, *Non-Lethal Weapons Technologies*, *supra* note 48, at 114-17 (arguing that expansive claims about the effectiveness of biological or chemical anti-materiel NLW are unreliable); *Disabling Technologies: A Critical Assessment*, *supra* note 59, at 33.

notions in varying stages of development.⁶¹ Some seem hopelessly ambitious, others may be of questionable military or police value, but work is progressing apace. In one program, researchers are exploring high power microwave or electromagnetic pulse (EMP) devices that might be able to turn off the electrical system of an approaching car or truck at a standoff distance, so that even if the driver refused directions to stop at a checkpoint, the vehicle could be halted before it got too close. But so far, the concept works only against modern computer-assisted cars, not against the older, simpler iterations of vehicles that would be more readily employed against American forces by terrorists in developing countries.⁶² Another mysterious technology would employ a “vortex ring generator” to create invisible energy circles (akin to smoke rings, but with a tremendous punch) that could be propagated through the air at fifty to seventy meters per second to collide with targeted individuals.⁶³

Some of the new technologies may provide a modern twist to old problems. For example, a “ring airfoil grenade” might provide a new form of non-lethal bullet. The grenade would be an aerodynamic, soft rubber-like ring designed to spin in flight after being shot from a ordinary-looking firearm, making it accurate to forty to sixty meters, with a stunning—but not lethal—impact.⁶⁴ Another modest advance would be newer generations of “flash-bangs,” multisensory grenade-like devices that an assault team could use to temporarily stun barricaded targets through dazzling lights, loud noises, and foul smells, enabling the authorities to seize control of the situation in the moments of

61. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 120-47.

62. CFR TASK FORCE 3, *supra* note 21, at 25; NATIONAL RESEARCH COUNCIL, *supra* note 5, at 30; Siniscalchi, *supra* note 5, at 135-36; U.S. Air Force Research Laboratory, Fact Sheet: High Power Microwaves (Sept. 2002); Ian Sample, *Police Test Hi-Tech Zapper That Could End Car Chases*, GUARDIAN (London), July 12, 2004; see FUTURE WAR, *supra* note 6, at 64-67 (describing evolution of EMP research programs).

63. See FUTURE WAR, *supra* note 6, at 100; Altmann, *Acoustic Weapons*, *supra* note 48, § 6.4 (vortex rings could be used to transport irritating chemicals or hot gases, possibly useful for dispersing crowds).

64. FUTURE WAR, *supra* note 6, at 91 (noting that a ring airfoil grenade round could be fired from a standard M16 rifle adapted with a special launcher; the ring spins in flight at 5000 revolutions per second, to keep it stable, and as it flies, it expands, so it covers a greater area upon impact, minimizing injuries); NATIONAL RESEARCH COUNCIL, *supra* note 5, at 25; Heal, *supra* note 18, § 4.5 (ring airfoil is the only kinetic energy bullet that is non-lethal even immediately after leaving the muzzle of the firearm, but it is ineffective beyond about thirty meters).

LETHAL AND NON-LETHAL WEAPONS

chaos.⁶⁵ Other forms of momentarily blinding laser “dazzlers” might also be improved to provide a short-term advantage for a police or military assault squad.⁶⁶ Yet another program suggests creating a vast quantity of opaque, breathable aqueous foam—like a wall of soap bubbles—to disorient and subdivide a crowd.⁶⁷

The candidate NLW technologies could be combined in all sorts of ingenious ways. A plastic bullet can be contrived to carry a packet of OC, to explode into a disabling spray upon impact; projectile netting might be outfitted to carry an electrical charge, to further encumber the victim.⁶⁸ As Malcolm Wiener has noted, even if a target of police or military forces came to the fray equipped to negate one form of NLW, it is difficult to imagine a terrorist or street-mob armed simultaneously with gas masks, earplugs, body armor, shield mirrors, sand (to throw on slippery foam), and medications (to combat nausea).⁶⁹

D. *Non-Lethal Missions*

Where did all the sudden interest in NLW come from? What has inspired so many recent investigations into novel non-lethal concepts? This Section describes a few of the “classic” scenarios in which military and police officials imagine that new capabilities might prove useful and superior to existing arms that too often leave them inadequate flexibility and deftness.⁷⁰

65. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 29 (future flash grenades, using a novel fuel-air mixture containing a metalized powder, would greatly reduce the concussion power of the arm, and accordingly minimize injuries).

66. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 28-29.

67. Tommy D. Goolsby, *Aqueous Foam as a Less-Than-Lethal Technology for Prison Applications*, in SECURITY SYSTEMS & NONLETHAL TECHNOLOGIES FOR LAW ENFORCEMENT, *supra* note 38, at 86; see APPELLEGGATE, *supra* note 11, at 291-93.

68. See, e.g., FUTURE WAR, *supra* note 6, at 83, 91, 102; Davison & Lewer, *supra* note 41, at 40-41; Mihm, *supra* note 23. A combined effects munition might inflict much less trauma than would a conventional blunt impact bullet and might carry such a small amount of pepper spray that it avoids the dangers conventionally associated with that type of device, too—but it might, through their synergistic effects, achieve the intended result better than either “pure” kind of weapon alone.

69. Email correspondence with Malcolm Wiener (Sept. 20, 2004) (on file with author).

70. Regarding hypothetical and real scenarios in which NLW might have been applied, see CFR TASK FORCE 1, *supra* note 7, at 3-8. See generally FUTURE WAR, *supra* note 6, at 125-57; CHARLES SWETT & DAN GOURE, CTR. FOR STRATEGIC & INT’L STUDIES, NON-LETHAL WEAPONS POLICY STUDY, FINAL REPORT 62-79, 87-130 (1999) [hereinafter CSIS NLW REPORT]; *Joint Concept*, *supra* note 5, at A8-A13; U.S. DEP’T OF DEF., JOINT NON-LETHAL WEAPONS PROGRAM, MASTER PLAN 2-8 (June 2000); Siniscalchi, *supra* note 5, at 143-49; CFR TASK FORCE 3, *supra* note 21, at 51-57; Mandel, *supra* note 24.

1. Military Scenarios

The first element animating the newfound military curiosity about NLW comes from “military operations other than war” (MOOTW).⁷¹ American forces nowadays are increasingly deployed abroad to perform functions that differ in significant respects from the traditional notion of large-scale, force-on-force combat. Peacekeeping operations, for example, may emphasize the task of separating two wary combatants, providing a disengagement barrier to deter further fighting. An armed U.S. military force may sometimes provide the best such bulwark, but any exercise of traditional, lethal force—even in self-defense—might trigger an outbreak of the very hostilities the United States is seeking to avoid.⁷²

Similarly, other military missions require a forceful presence, but with a discreet touch. If U.S. troops are performing a humanitarian mission—for example, providing protection for a relief mission that is distributing meals and medical services to a war-ravaged locale—it hardly makes sense to train deadly force upon the very people we are trying to aid. But what should the troops do if the populace, growing weary of their plight, riots at the sight of a food truck?⁷³

To take a slight variant, imagine U.S. troops dispatched into a volatile country to provide protection for a U.S. embassy or base, or to help evacuate American civilians who have fallen into harm’s way in the midst of a *coup d’etat* or a martial law situation. What should the troops do if their position is approached by a large and unruly crowd, a mob composed mostly of unarmed angry civilians, sprinkled with a handful of more determined armed provocateurs? In particular, what should the U.S. soldiers do if a shot is fired? Loosing indiscriminate lethal force upon the crowd is obviously unacceptable, but so is doing

71. DoD Directive No. 3000.3, *supra* note 1, § 4; U.S. Army, Field Manual 3-07, Stability Operations and Support Operations (Feb. 2003); *Joint Concept*, *supra* note 5, at A1; CFR TASK FORCE 2, *supra* note 7, at 10-15; NATIONAL RESEARCH COUNCIL, *supra* note 5, at 15; Duncan, *supra* note 9, at 33-35. MOOTW missions include a vast array of military activities, including counter-terrorism and counter-drug operations, peacekeeping, humanitarian and disaster assistance, and support for law enforcement.

72. Regarding possible applicability of NLW in peacekeeping and related peace enforcement and peace support operations, such as those undertaken in recent years in Haiti, Somalia, and the former Yugoslavia, see NATIONAL RESEARCH COUNCIL, *supra* note 5, at 61-62; *Joint Concept*, *supra* note 5, at A12-A13; U.S. DEP’T OF DEF., JOINT NON-LETHAL WEAPONS PROGRAM, KOSOVO INCIDENT CASE STUDY: USE OF NON-LETHAL WEAPONS (Apr. 4, 2000) (noting successful use of sponge grenades, foam batons, and stinger rounds).

73. *Joint Concept*, *supra* note 5, at A8.

LETHAL AND NON-LETHAL WEAPONS

nothing while allowing the perpetrators a safe haven to keep firing.⁷⁴

The first concerted application of significant NLW in modern military history came in just this sort of situation, where civilians and fighters were thoroughly mixed, and where U.S. forces could not adequately differentiate between threatening and non-threatening groups aligned against them. In 1995, the thirteenth Marine Expeditionary Unit was assigned the daunting mission of covering the withdrawal of 2,500 United Nations peacekeepers from chaotic Somalia, while providing protection against native war lords, disorganized military, and paramilitary units.

Lieutenant General Anthony C. Zinni boldly decided to include a variety of NLW in the Marines' training and equipment for this operation "United Shield," and his departure from standard operating procedures garnered a substantial amount of publicity. Among the unconventional tools deployed to Somalia were: sticky foam, used to create temporary, immediate barriers; caltrops, sharp-edged pyramids that could puncture the tires of vehicles following too closely; flash-bang and stinger grenades; low-kinetic-energy rounds which fired beanbags or wooden plugs; laser dazzlers and target designators; and chemical riot control agents.

The mission was a resounding success, due at least in part to the deterrent effect of the unfamiliar non-lethal arms, which allowed the Marines to protect themselves and the UN forces, even against hordes of people pressing around them. The UN forces successfully completed their withdrawal from Mogadishu, and Lieutenant Zinni, reflecting upon the precedent-setting use of NLW, concluded, "I think the whole nature of warfare is changing."⁷⁵

74. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 58-59. A similarly urgent need is for the development of new NLW systems to help protect U.S. Navy vessels in foreign ports, to avoid another catastrophe such as the attack on the USS Cole in Yemen in October 2000. Advocates imagine a "layered" system, including NLW, in which increasingly emphatic warnings and deterrence measures are engaged as unknown vessels (including, of course, even small and apparently-innocent boats) approach the ship. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 16-17, 115-18.

75. Rick Atkinson, *Lean, Not-So-Mean Marines Set for Somalia*, WASH. POST, Feb. 25, 1995, at A22; *see also* NATIONAL RESEARCH COUNCIL, *supra* note 5, at 53; FUTURE WAR, *supra* note 6, at 23-25; Duncan, *supra* note 9, at 1-3; LEWER & SCHOFIELD, *supra* note 3, at 68-72; Eric Schmitt, *Now, to the Shores of Somalia with Beanbag Guns and Goo*, N.Y. TIMES, Feb. 15, 1995, at A10; Wallace, *supra* note 7, at 147-48.

In an earlier deployment, named "Restore Hope," in Somalia, U.S. forces also had been equipped with some NLW. But that 1993 experience was much less satisfactory. Wooden batons proved unsuccessful in controlling crowds that pressed in upon the Marines and the Army

A rather different motivation for NLW has also emerged even in the context of full-scale traditional combat.⁷⁶ Since World War II, the United States and its allies have fought limited wars for limited purposes. Even during the most intense combat, the United States contemplates what will be done once the shooting stops, hoping to create the most advantageous post-conflict environment. In particular, it often turns out that the United States will help reconstruct the erstwhile enemy and, therefore, will share an interest in preserving intact as much as possible of the country's infrastructure. In short, the United States fights to win the war as quickly as possible, while simultaneously keeping one eye on winning the peace. The latter process is often materially assisted by avoiding cataclysmic damage to critical roads, bridges, power plants, and the like.⁷⁷

Non-lethal weapons can provide a rare mechanism for pursuing both sets of goals simultaneously, preventing the enemy from using a resource to the detriment of the United States during the war, but also preserving it so it can more quickly and easily be restored to full functioning to assist the civilian economy in post-war recovery. For example, during the 1999 fighting in Yugoslavia, the United States refrained from attacking a crucial electrical switching installation in Belgrade with ordinary explosive ordnance. The facility was a legitimate military target, providing power used by the armed forces, but its complete destruction would also have retarded restoration of normal services to civilians during and after that short conflict. The solution was a "soft kill" attack: loads of carbon fiber strips were dropped onto

Rangers, and the forces were tentative about authorizing and using their OC. In one instance a soldier was disciplined for shooting his firearm at a civilian who had stolen his sunglasses—he asserted that there was no other way to prevent such looting. Conversely, in another situation, marines did use pepper spray against a local man who was brandishing a knife; the spray succeeded in subduing the threat, but only after the Somali had repeatedly attempted to stab the Americans. Jonathan T. Dworken, *Rules of Engagement, Lessons from Restore Hope*, MIL. REV., Sept. 1994, at 26; F.M. Lorenz, *Confronting Thievery in Somalia*, MIL. REV., Aug. 1994, at 46; F.M. Lorenz, *Law and Anarchy in Somalia*, PARAMETERS, Winter 1993-1994, at 27.

76. A related venue for modern combat—and another sector in which NLW may provide additional value—is Military Operations in Urban Terrain (MOUT). Where the fighting occurs in the middle of a city or other built-up area, the danger of collateral damage to civilians and infrastructure is intensified. Non-lethal capabilities may allow forces to pursue their missions, and to protect themselves, even in the midst of non-combatants. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 57-58; Jez Littlewood, *NLW and Urban Warfare: Aspects of US Thinking*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, § 3.

77. DoD Directive No. 3000.3, *supra* note 1, § 4.3; FUTURE WAR, *supra* note 6, at 14-15 ("Recent history has shown that it is usually the victor who bears the heavier financial burden" of rebuilding after the end of hostilities.).

LETHAL AND NON-LETHAL WEAPONS

the facility, causing massive electrical short-circuits and putting the grid out of order (thereby denying service to the military) in the short term. The results were reversible relatively rapidly, facilitating the subsequent restoration of normal service for peaceful purposes.⁷⁸

Non-lethal weapons, therefore, offer the possibility of multiple technologies available for a variety of modern military missions. NLW may find application in both tactical, short-range maneuvers—e.g., to facilitate the operations and self-protection of a small unit operating within a confined space—and in strategic, long-range operations—e.g., to help prepare the battle-space by compromising the integrity of enemy assets such as airstrips and railyards long before assaulting troops arrive on the scene.

2. Police Scenarios

Like the military, the police⁷⁹ are frequently confounded by sensitive and complex use of force situations. The police may need, for example, to control an unruly crowd of demonstrators and to prevent them from

78. Jim Drinkard, *Airstrikes Short-Circuit Yugoslavia; High-Tech Bombs Cut Off Electricity*, USA TODAY, May 4, 1999, at A8; Dana Priest, *New Bomb Shorted Out Power; NATO Hit Belgrade Grid with Classified, Lightning-Like Missile*, WASH. POST, May 4, 1999, at A15. In contrast, NATO employed ordinary high explosive bombs against other types of targets in Yugoslavia, such as many of the bridges over the Danube River, causing their total collapse. Some of these assets remained unusable years after the fighting, to the profound disadvantage of both Yugoslavians and their international patrons. Richard Bernstein, *Down the River to the Sullen Balkans*, N.Y. TIMES, Aug. 19, 2003, at A6.

American forces employed similar anti-materiel non-lethal tactics against Iraq during the 1991 Gulf War. Tomahawk cruise missiles dropped thousands of long spools of very fine carbon fibers onto switching and transformer areas of several major electrical facilities, causing massive short circuits. The effect was to remove the generators from service during the early hours of the fighting, disrupting Iraq's ability to respond to the air assault, but not destroying the generators. The Iraqis were able to remove the fibers and restore service within a day or two. LEWER & SCHOFIELD, *supra* note 3, at 66-67; Human Rights Watch, *The Means and Methods of Attack, in NEEDLESS DEATHS IN THE GULF WAR: CIVILIAN CASUALTIES DURING THE AIR CAMPAIGN AND VIOLATION OF THE LAWS OF WAR* (1991), available at <http://www.hrw.org/reports/1991/gulfwar/CHAP3.htm> (criticizing large-scale and long-term damage inflicted upon the Iraqi electrical system, which resulted in devastating consequences for the civilian population); David A. Fulghum, *Secret Carbon-Fiber Warheads Blinded Iraqi Air Defenses*, AVIATION & SPACE TECH., Apr. 27, 1992, at 18.

79. For purposes of this Article, the category of "police" refers generally to the full spectrum of domestic law enforcement officials, including a variety of federal, state, and local authorities such as sheriffs, U.S. Marshals, Secret Service, Federal Bureau of Investigation, Bureau of Alcohol, Tobacco, Firearms and Explosives, Drug Enforcement Administration, and others who perform cognate missions. It can also include National Guard units and military personnel performing missions of assistance to civil authorities.

destroying property, but they obviously do not want to apply deadly force.⁸⁰ They may need to pursue a fleeing felon, but high-speed car chases are notoriously dangerous in urban areas.⁸¹ The police may need to subdue a belligerent person, especially someone intoxicated by alcohol or drugs, impeding compliance with verbal instructions, but ordinary measures of force can quickly become excessive.⁸² They frequently need to transport a dangerous person—dangerous to himself, to the officers, and even to their squad car—to a station or jail.⁸³ Corrections institutions, too, are another plausible venue for law enforcement NLW; prison disruptions and riots can be disastrous, and

80. See generally Jussila, *supra* note 37, at 87-98. Police use of pepper spray, rubber bullets, and other NLW riot control equipment has become familiar in situations such as dealing with mass protests, as against World Bank meetings. See Dana Clark Felty, *Protesters Arming Themselves with Lawyers*, SAVANNAH MORNING NEWS, June 4, 2004, at B1; Jose Ceja, *Non-Lethal Weapons Crucial to Breaking Up 4th Ave. Riots*, ARIZ. DAILY WILDCAT, Apr. 19, 2001 (dealing with student explosions, as after notable basketball games), available at http://wildcat.arizona.edu/papers/94/140/01_1_m.html.

81. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 68. From 1990 to 1994, an average of 331 people were killed annually in police pursuits, despite an array of pre-emplaced barriers or tire-deflation systems used by 90% of law enforcement agencies. *Id.* The bizarre 1994 pursuit of O.J. Simpson in his famous white Bronco demonstrated how police officers' hands may be tied even in low-speed chases, lacking adequate mechanisms to force a possibly suicidal driver to stop without danger.

82. Among the most difficult situations for police are confrontations with individuals who, due to alcohol, drugs, or mental impairments, are outside the realm of ordinary conversation, instruction, and deterrence. Especially when armed, such people can pose significant threats to themselves, the police, and others—and the scenario of “suicide by cop,” in which the person is seemingly intent upon inciting a lethal incident, is particularly agonizing. Police hope that non-lethal weapons can sometimes provide part of the solution. See, e.g., H. Range Hutson et al., *Suicide by Cop*, 32 ANNALS EMERGENCY MED. 665, 665-69 (1998); Earnest Winston, *Covington Takes Steps for Safety: Beanbag Guns, Mental-Health Training to Give Police Non-Lethal Options*, CINCINNATI ENQUIRER (Ky. Edition), Sept. 18, 1997, at B1 (beanbag shotguns adopted in aftermath of shooting death in nearby city of a “brick-wielding mental patient”); *Detroit Police Consider Use of Non-Lethal Weapons*, UPI, Nov. 22, 1992 (Detroit police investigate tear gas and stun guns, following death of a motorist allegedly beaten by police); *Another Option for the Police*, FORT LAUDERDALE SUN-SENTINEL, Oct. 16, 2002, at 18A (successful use of taser against mentally disturbed young woman armed with knife).

83. FUTURE WAR, *supra* note 6, at 54 (noting that even with steel separations between the prisoner and driver, and even when securely handcuffed, a strong, determined, or substance-abusing person can still cause havoc, kicking at windows and pounding his head on the divider); U.S. Dep't of Justice, National Institute of Justice, Office of Science & Technology, Law Enforcement Technology for the 21st Century, Conference Report, May 15-17, 1995, at 13 (NCJ 158024) (describing a strong rear seat air bag for the back of a police car; it can be inflated at the push of a button, to pin a recalcitrant prisoner in place, while allowing him or her to breathe during transportation), available at <http://www.nleetc.org/virlib/InfoDetail.asp?intInfoID=175>.

LETHAL AND NON-LETHAL WEAPONS

conventional weaponry alone may not provide a sufficiently discriminating response.⁸⁴

In the worst scenarios, police may confront a hostage or barricade situation, in which an armed individual or group is positioned in the midst of, and shielded by, innocents. Extreme measures of force may be required to apprehend and disarm the antagonist and free the victims—as well as to protect the police themselves—but too often bystanders may be jeopardized by a lethal crossfire.⁸⁵

Like the military, police officials experience the most severe strains regarding the use of deadly force, and they do so on a daily basis. The “mixed” situation—any of those in which the legitimate target of force is intermingled with innocents—provokes the greatest disquiet; deft applications of official violence are, too often, impossible. Compared to military forces, police often operate at closer range and, quite frequently, with greater presence of nearby civilians and with an even greater intolerance for collateral damage.⁸⁶

Against that background, police forces across the country have a much greater wealth of experience in operating the low-tech, inexpensive variants of NLW. But the available NLW arsenal for law enforcement is far from adequate. As far back as Lyndon Johnson’s administration, the United States Government recognized the need for, and committed itself to develop and procure, safer and more effective mechanisms of crowd control.⁸⁷ Nonetheless, despite immense techno-

84. See, e.g., *Death Row Inmates Riot at Mansfield*, CLEVELAND PLAIN DEALER, Sept. 6, 1997, at B5 (a seven-hour riot in the death row of the Mansfield Correctional Institution near Cleveland ended when a prison tactical squad fired tear gas into the unit and regained control; one member of the squad and four inmates sustained minor injuries, following an uprising in which prisoners overpowered three guards, took their keys, and freed several death row inmates from their cells); Robert Knox, *Prison Looks to ‘Less-Lethal’ Weapons*, BOSTON GLOBE, Oct. 12, 2003, at B1.

85. Ken Hubbs, *Less Lethal Munitions as “Extended Range Impact Weapons,”* in SECURITY SYSTEMS & NONLETHAL TECHNOLOGIES FOR LAW ENFORCEMENT, *supra* note 38, at 37 (noting the special value of NLW capable of affecting targets at sufficient range that they cannot use their own weapons against police).

86. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 66-68; see also Tony Pfaff, *Military Ethics in Complex Contingencies: Adapting the Warrior Ethic* (Oct. 25, 2004) (paper presented at Georgetown University Law Center, on file with the Georgetown Journal of International Law) (arguing that police, unlike military, may never knowingly employ lethal force against civilians).

87. LYNDON JOHNSON, *THE CHALLENGE OF CRIME TO OUR SOCIETY*, H.R. DOC. NO. 90-250, at 14 (2d Sess. 1968):

Revolvers and nightsticks are clearly inadequate for the many different crises faced by the police. New weapons and chemicals—effective but causing no permanent injury—have been and are being developed. But too little is now known about their potential to

logical growth in so many other sectors of modern American life, domestic law enforcement officials still often feel that they are equipped little differently than their nineteenth century predecessors, such as Wyatt Earp; if somebody will not heed their verbal commands, their only real recourse is to a firearm.

* * *

In sum, non-lethal weapons carry the promise of important new capabilities for police and military units in the twenty-first century. It is difficult to predict at this point which of these novel systems will ultimately prove to be “revolutionary technologies” and which will be revealed as dead ends, but it is clear that something important is already occurring.

The most obvious and familiar manifestations of NLW innovation may be the least provocative: caltrops, flash-bangs, projectile netting, and the like are useful, but they can be improved only so much further and do not raise the most pressing questions of law, tactics, or ethics. Similarly, the JNLWD has concluded, and the Department of Justice seems to concur, that the wave of the future for NLW does not feature further refinements on kinetic energy projectiles—technology has, for the most part, gone about as far as possible with plastic, rubber, and wooden bullets—so future iterations of blunt trauma munitions will be noteworthy only if they can offer appreciably greater range, safety, or reliability.

For very different reasons, the realm of chemical and biological NLW proceeds under a cloud. As discussed in the next section, international obligations and domestic statutes put Biological Warfare (BW) entirely off limits, and there is little reason to want to disturb those strictures in

preserve order while protecting lives. Too little is known about their limitations. I am instructing the Director of the Office of Science and Technology, working with the Attorney General and law enforcement officials, to study these new weapons and chemicals and other new techniques in crime control. The results of this study will be made available to enforcement agencies throughout the country.

In addition, the National Advisory Commission on Civil Disorders’ 1968 report notes that “[f]or the most part, the police faced with urban disorders last summer had to rely on two weapons—a wooden stick and a gun. Our police departments today require a range of physical force with which to restrain and control both more humanely and more effectively.” NAT’L ADVISORY COMM’N ON CIVIL DISORDERS, REPORT OF THE NATIONAL ADVISORY COMMISSION ON CIVIL DISORDERS 330 (1968). It called on “[t]he federal government to undertake an immediate program to test and evaluate nonlethal weapons and related control equipment for use by police and control forces.” *Id.* at 492.

LETHAL AND NON-LETHAL WEAPONS

order to proceed with biological or toxin weapons designed for anti-personnel applications. The notion of anti-materiel BW (bugs that would quickly and perhaps covertly degrade metal armor, petroleum products, or machine parts) still seems far-fetched. The Chemical Weapons Convention likewise takes most military applications of toxic chemicals off the table; despite the lingering notion that chemical combat (especially non-lethal chemical combat) might be useful and even humane in some circumstances, the global consensus has strongly moved in the opposite direction. Riot control agents—including possibly a wide range of new calumative, malodorant, and other concoctions—remain available for domestic law enforcement purposes, as well as for a host of “military operations other than war.” The prospect of leakage from permitted chemical NLW operations into treaty-forbidden practices is a serious issue; so again, there is a cap on the future utility of non-lethal chemicals.

The realm of directed-energy NLW seems to be the most tantalizing prospect. The VMADS millimeter wave heat ray, the possibility of improved acoustic systems, and comparable mechanisms suggest the ability to affect people, buildings, and objects at standoff distances that would truly provide a revolutionary new capability. The technology is not yet battle-tested—the new Sheriff system planned for deployment in Iraq will provide the first operational evaluation⁸⁸—but already there is reason to be hopeful that the new NLW can make a useful contribution in the most difficult engagements.

No one should be too sanguine about the promise of NLW; there have been plenty of instances in which a promising new military technology conspicuously failed to live up to its advance billing. And even advocates grumble that progress has been slower than anticipated in bringing advanced NLW concepts from the drawing-board into the field.⁸⁹

What is clear, however, is the large and growing effort now being devoted to the enterprise. Government-sponsored research is progressing, loosely coordinated between the Department of Defense, which

88. Freinberg & Rayment, *supra* note 50.

89. CFR TASK FORCE 2, *supra* note 7, at viii (noting that in 1999, the Independent Task Force found that “weapons development and thinking about [NLW] usage has been very slow. Non-lethal warfare has received low priority in the Department of Defense (DoD), as evidenced by insufficient research and development funding, inadequate attention to the implications for military doctrine, barriers to information transfer among the military services and between the DoD and the relevant civilian agencies, and DoD resistance to complying with legislative direction.”).

brings more money to the table, and the Department of Justice, which draws upon more extensive experience in operating NLW through state and local police forces.⁹⁰ Even more, private enterprise has adopted the NLW mission with alacrity and enthusiasm, and human inventiveness guarantees that candidate non-lethal programs of all sorts, based on a wide variety of physical mechanisms, will be explored and tested, and perhaps deployed and utilized, in the coming years.⁹¹

III. THE LAW OF NON-LETHAL WEAPONS

Both international and domestic law fail to make adequate provision for non-lethal weapons. The existing standards were, of course, crafted with other stimuli in mind, and contemporary treaties, statutes, and other legal tools have, for the most part, not yet been adapted to the unprecedented stresses and opportunities of the modern capabilities. Still, there are some shreds of law that do regulate the emerging world of NLW, for better or worse.⁹² This Section explores three topics. First, it surveys the international context, treaties, and customary rules that govern selected aspects of the weaponry wielded by American and other armed forces. Second, it looks at the domestic U.S. statutory law that forecloses one important potential avenue of NLW research and development regarding biological weapons. Third, it examines the domestic U.S. constitutional and other law regulating police use of force, including NLW capabilities, and highlights the evolving jurisprudence in the field.

90. U.S. Dep't of Justice, National Institute of Justice, Office of Science & Technology, Technology Solutions for Public Safety, Conference Report, Apr. 9-11, 1996, at 12 (NCJ 162532) (noting advantages of transferring military technology to law enforcement, to address common missions, save tax dollars, and field test the equipment), available at <http://www.nlectc.org/virlib/InfoDetail.asp?intInfoID=174>.

91. Coppernoll, *supra* note 40, at 128 (concurring with "the scholars, military leaders, and planners who postulate that in the decades to come the political and military value of the now-emerging non-lethal capability will be regarded as superior to lethal ones in the furtherance of the national security policy and national strategy, because it fills so well the gap between oral warnings and deadly force"); CSIS NLW REPORT, *supra* note 70, at 40-41 (summarizing current and future advantages of NLW); DAVID A. MOREHOUSE, NONLETHAL WEAPONS: WAR WITHOUT DEATH 5 (1996) ("Nonlethality is a revolutionary concept that can guide the international community into realizing a new world order. When non-lethal technologies replace old weapons of destruction, diplomacy will take its rightful place as the supreme method of conflict resolution.").

92. See generally Fidler, *The International Legal Implications of "Non-Lethal" Weapons*, *supra* note 3.

LETHAL AND NON-LETHAL WEAPONS

A. *International Law on NLW*

Only a few treaties deal directly with non-lethal weapons, and they do so in a distinctly incomplete fashion, but those few exemplars are worth exploring. Similarly, the international law of armed conflict imposes a number of general limits on the use of non-lethal weapons.

1. Chemical Weapons Convention

The first noteworthy relevant international agreement is the 1993 Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (Chemical Weapons Convention or CWC).⁹³ The CWC is a comprehensive edict against a particularly obnoxious form of combat, and it has attracted 164 parties, reflecting the world's consensus that this hideous scourge is to be avoided absolutely.⁹⁴ At the same time, however, the scope of the treaty's prohibitions must not be too broad. Because of the phenomenon of "dual capability"—many of the same chemical substances can be used both for weapons and for plastics, paints, fertilizers, and insecticides across the full spectrum of the global civilian economy—the treaty must be careful not to disrupt essential patterns of commercial activity.⁹⁵

The CWC, therefore, defines its applicable coverage with care. A

93. Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, *opened for signature* Jan. 13, 1993, S. TREATY DOC. NO. 103-21, 1974 U.N.T.S. 3 (entered into force Apr. 29, 1997) [hereinafter CWC]; *see also* Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, *signed* June 17, 1925, 26 U.S.T. 571, 94 L.N.T.S. 65 (The Geneva Protocol) (earlier instrument outlawing the use of chemical weapons in particular circumstances, but not forbidding their development and possession).

Regarding the international control of chemical weapons, see generally Charles C. Flowerree, *Chemical and Biological Weapons and Arms Control*, in 2 *ENCYCLOPEDIA OF ARMS CONTROL & DISARMAMENT* 999 (Richard Dean Burns ed., 1993); William Lawler, *Progress Towards International Control of Chemical and Biological Weapons*, 13 *TOL. L. REV.* 1220 (1982); George Bunn, *Banning Poison Gas and Germ Warfare: Should the United States Agree?*, 1969 *WIS. L. REV.* 375 (1969); Fact Sheet 1: The Chemical Weapons Convention & the CWC—How They Came About (Organization for the Prohibition of Chemical Weapons, The Hague, The Netherlands), July 2000, *available at* <http://www.opcw.org/docs/fs1.pdf>.

94. State Parties to the Chemical Weapons Convention, *at* http://www.opcw.org/html/db/members_ratifier.html (last modified Nov. 19, 2004). The United States, as well as all the other permanent members of the United Nations Security Council, are members.

95. Julian Perry Robinson, *The Negotiations on the Chemical Weapons Convention: A Historical Overview*, in *THE NEW CHEMICAL WEAPONS CONVENTION—IMPLEMENTATION AND PROSPECTS* 17 (Michael Bothe et al. eds., 1998); Raija Hanski, *On-Site Inspections as a Form of Verification in Arms Control*

“chemical weapon” includes “[t]oxic chemicals and their precursors, except where intended for purposes not prohibited under this Convention, as long as the types and quantities are consistent with such purposes.”⁹⁶ This definition leads to two other essential definitions. First, a “toxic chemical” is “[a]ny chemical which through its chemical action on life processes can cause death, *temporary incapacitation* or permanent harm to humans or animals.”⁹⁷ The most important of such toxic chemicals are identified on a series of three “schedules” annexed to the treaty and are the subject of a detailed verification regime, incorporating elaborate reporting and inspection requirements.⁹⁸

Second, the term “purposes not prohibited under this Convention” includes an array of industrial, agricultural, medical, and other peaceful purposes, as well as “[l]aw enforcement including domestic riot control purposes.”⁹⁹ This last exemption then requires the introduction of an additional set of crucial terms and constraints. Under the CWC, “[e]ach State Party undertakes not to use riot control agents as a method of warfare.”¹⁰⁰ Riot control agent is then defined as “[a]ny

Agreements, in THE NEW CHEMICAL WEAPONS CONVENTION—IMPLEMENTATION AND PROSPECTS, *supra*, at 37.

96. CWC, *supra* note 93, art. II § 1(a), 1974 U.N.T.S. at 319-20. A chemical weapon consists of two components: the lethal or non-lethal agent (e.g., sarin nerve gas or OC pepper spray) and the munition or device (e.g., a bomb, mine, or spray tank) that is used to contain the agent, transport it to the target, and disperse it. For present purposes, we are concerned only with the agent, although the CWC tightly regulates the delivery systems too. *Id.* art. II § 1(b).

97. *Id.* art. II § 2 (emphasis added).

98. *Id.*; *id.* Annex on Chemicals; *id.* Annex on Implementation and Verification.

99. *Id.* art. II § 9(d). The CWC thus does not bar the use of small quantities of chemical weapons agents for “protective purposes” such as in experiments designed for the development of improved anti-CW self-defense equipment such as gas masks. *See id.* art. II § 9(b). However, chemicals listed on schedule 1 of the treaty (the most dangerous substances—those toxic chemicals and their precursors that have previously been developed or produced as chemical weapons) may be used only for a narrower range of peaceful purposes, not including law enforcement or riot control purposes. *Id.* Annex on Implementation and Verification, Part VI.2; David Fidler, Interpretation of Article II.9(d) of the Chemical Weapons Convention in Regard to the Use of Toxic Chemicals for Law Enforcement Purposes, Memorandum to FAS Working Group Law Enforcement Under the Chemical Weapons Convention (Apr. 24, 2003) [hereinafter Fidler Memo—Article II.9(d) of the CWC].

Likewise, the treaty recognizes the fact that many ordinary weapons rely upon substances—such as gunpowder or rocket fuel—that might fit the criteria of “toxic chemicals” in being harmful to humans, but those chemicals are not being used in combat in a fashion that exploits their toxic nature. The treaty therefore exempts “[m]ilitary purposes not connected with the use of chemical weapons and not dependent on the use of the toxic properties of chemicals as a method of warfare.” CWC, *supra* note 93, art. II § 9(c), 1974 U.N.T.S. at 319-20.

100. CWC, *supra* note 93, art. I § 5, 1974 U.N.T.S. at 318-19.

LETHAL AND NON-LETHAL WEAPONS

chemical not listed in a Schedule, which can produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure.”¹⁰¹

The CWC further requires each party to declare the chemical name, structural formula, and registry number (although not the quantity produced, the location, or the purpose) of each chemical held for riot control purposes and to update the information within thirty days of any change.¹⁰²

The interplay of these terms and their net effect on non-lethal chemicals have been muddled and controversial; the suitability of riot control agents on the battlefield has been a legal, tactical, and political quagmire for decades predating and under the CWC.¹⁰³ The United States has traditionally argued that riot control agents do not fit the criteria of “toxic chemicals” and are therefore not “chemical weapons” under the treaty. Accordingly, riot control agents may be produced, stockpiled, and deployed without limits, subject only to the restriction that they may not be used “as a method of warfare.”¹⁰⁴ Virtually all other parties and observers argue, conversely, that riot control agents *are* toxic chemicals under the CWC, *are* chemical weapons, and thus may be held only in quantities and types appropriate for the articulated “peaceful purposes,” as well as not being valid “as a method of warfare.”¹⁰⁵

Only small operational consequences may now remain in this legal brouhaha. The United States has placed severe internal restraints against even approaching any uses of riot control agents in the most

101. *Id.* art. II § 7, 1974 U.N.T.S. at 319-20.

102. *Id.* art. III § 1(e), 1974 U.N.T.S. at 320-21.

103. CFR TASK FORCE 3, *supra* note 21, at 30-32, 61-63 (reviewing U.S. use of tear gas in Vietnam; noting that in some scenarios, judicious use of chemicals could help save lives on all sides of a battle, but any application of even non-lethal chemicals would inevitably raise the danger of triggering a massive retaliatory employment of lethal CW); David Isenberg, *Next Up: ‘Non-Lethal’ Chemicals That Kill*, ASIA TIMES (Hong Kong), Apr. 1, 2003, at http://atimes01.atimes.com/atimes/Middle_East/ED01Ak02.html.

104. Ernest Harper, *A Call for a Definition of Method of Warfare in Relation to the Chemical Weapons Convention*, 48 NAVAL L. REV. 132, 134-43 (2001); Fidler Memo—Article II.9(d) of the CWC, *supra* note 99; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 72-73; W. Hays Parks, *Classification of Chemical-Biological Warfare*, 13 TOL. L. REV. 1165 (1982); Bunn, *supra* note 93, at 394-406.

105. Harper, *supra* note 104, at 136-45; Fidler Memo—Article II.9(d) of the CWC, *supra* note 99; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 72; J.P. Winthrop, *Preliminary Legal Review of Proposed Chemical-Based Nonlethal Weapons* (U.S. Dep’t of the Navy, Office of the Judge Advocate General, International & Operational Law Division, National Security Law Branch), Nov. 30, 1997, at 13; Isenberg, *supra* note 103.

contentious hypothetical cases.¹⁰⁶ But what would be a use of chemicals, including non-lethal chemicals, as a prohibited “method of warfare”? Surely any employment against fighting forces would be covered, such as the American applications of riot control agents during the Vietnam War to drive enemy soldiers out of underground bunkers or tunnels.¹⁰⁷ A closer case might be “search and rescue” missions; for example, if a pilot is downed behind enemy lines, would it be legal to use riot control agents to prevent local civilians from approaching his position until a helicopter can extract him?¹⁰⁸ Or what if an enemy is illegally using civilians as “human shields”? Would it be an acceptable reprisal to employ a non-lethal gas that would incapacitate the entire crowd, permitting a more discrete application of deadly force against the perpetrators?¹⁰⁹ Most plausibly on the “legal” side of the fence would be the use of riot control agents in rear areas, away from the fighting, such as to control rioting civilians in occupied territory or

106. Under the Standing Rules of Engagement, promulgated by the U.S. Joint Chiefs of Staff to guide American forces in the field, non-lethal chemical weapons such as riot control agents may be used only with the direct approval of the national command authority, which is rarely given. See Harper, *supra* note 104, at 137-58 (observing that non-lethal chemicals may be lawfully used for purposes other than warfare, but they may be stockpiled only in forms and quantities that would be appropriate for those restricted applications); see also NATIONAL RESEARCH COUNCIL, *supra* note 5, at 80-82 (noting that development of new military NLW chemicals has received little attention since adoption of the CWC).

Non-governmental organizations, such as the Sunshine Project and the Centre for Conflict Resolution, Non-Lethal Weapons Research Project at Bradford University (UK), have been diligent in drawing attention to chemical and biological NLW programs that could raise issues about compliance with the relevant arms control treaties. See generally Sunshine Project, at <http://www.sunshine-project.org/>; Bradford Non-Lethal Weapons Research Program (BNLWRP), at <http://www.brad.ac.uk/acad/nlw/>; see also David P. Fidler, “Non-lethal” Weapons and International Law: Three Perspectives on the Future, MED. CONFLICT & SURVIVAL, July-Sept. 2001, at 194-204 (discussing the tension between international legal standards and NLW enthusiasts).

107. The United States employed non-lethal CS gas quite widely in Vietnam, to flush Vietcong fighters from subterranean enclaves, both to induce surrenders and to facilitate the subsequent application of lethal force. Paul L. Howard, *Operational Aspects of Agent CS*, Apr. 1973 (USATECOM Deseret Test Center Technical Report DTC-FR-S700M) (regarded as unclassified Dec. 1979); Bunn, *supra* note 93, at 394, 405-06.

108. See Harper, *supra* note 104, at 137-56; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 72-73.

109. In this scenario—where enemy belligerents are (in violation of international law) hiding behind civilians as willing or coerced shields—deft application of non-lethal chemicals might be expected to save lives, serving both a humanitarian role and enabling U.S. forces to accomplish their mission and protect themselves better. But even advocates of NLW concede that in practice even a limited employment of chemicals would likely propel the conflict down a notoriously “slippery slope” into general use of despised lethal CW. CFR TASK FORCE 3, *supra* note 21, at 61-63; Harper, *supra* note 104, at 149-52.

LETHAL AND NON-LETHAL WEAPONS

interned enemy prisoners of war.¹¹⁰ It is worth noting that anti-materiel chemical weapons—lethal or non-lethal—are outside the scope of the CWC altogether.

David Fidler has argued for a narrow interpretation of the phrase “law enforcement including domestic riot control purposes” within the CWC’s strictures allowing chemicals for “peaceful purposes.”¹¹¹ He asserts that the treaty permits a party to employ non-lethal chemicals to ensure compliance with its domestic legal strictures within its own territory and in areas subject to its jurisdiction, but does not authorize chemicals for extraterritorial enforcement of its domestic law or of international law. Furthermore, NLW chemicals could legitimately be applied by military forces in areas they occupy, or by authorized peacekeepers, for the law enforcement purpose of preserving public order and safety, but only against noncombatants.¹¹²

In contrast, Hays Parks has argued that the CWC’s outlawing of riot control agents as a “method” of warfare is appreciably less constricting than if the treaty had banned chemicals as a “means” of warfare. Under this analysis, the “methods” of warfare are broad policies, aimed at the strategic, operational level of war, while the “means” of warfare operate at the tactical level.¹¹³ The contemplated application of NLW chemicals on the battlefield would all be in discrete, specific, localized situations as “means” of accomplishing a particular mission, not as broad-gauged “methods” of defeating an enemy state. Accordingly, the CWC should be interpreted to tolerate these particularized applications of NLW riot control agents.¹¹⁴

Current U.S. policy stands approximately midway between these two perspectives, as reflected in Executive Order No. 11850, promulgated by President Gerald Ford in 1975. There, President Ford asserted the right to use riot control agents in defensive military modes to save lives, such as in four specified situations: (1) to control rioting prisoners of

110. Fidler Memo—Article II.9(d) of the CWC, *supra* note 99, at 12-16 (studying possible use of NLW chemicals in law enforcement operations undertaken inside other countries); Winthrop, *supra* note 105, at 13 (effect of U.S. deliberations regarding ratification of CWC).

111. Fidler Memo—Article II.9(d) of the CWC, *supra* note 99, at 3-4 (also observing that the treaty’s permission for chemicals in “law enforcement” is broader than the subcategory of “riot control.” Chemicals used for capital punishment, for example, would fit the former category, but not the latter.).

112. *Id.*; see also LEWER & SCHOFIELD, *supra* note 3, at 95-96 (noting the ambiguity in the CWC’s use of key terms, such as “law enforcement” and “method of warfare,” without providing adequate definitions).

113. Harper, *supra* note 104, at 154-55.

114. *Id.*

war; (2) to counter enemy attacks that use civilians as shields; (3) to rescue downed pilots; and (4) to protect rear areas away from the fighting against riots and terrorists.¹¹⁵ That position, despite its facial inconsistency with the CWC, has been frozen into U.S. law by the Senate's insistence during the treaty advice and consent process. But it is also clear that any application of even non-lethal chemicals in any near-battlefield circumstances would be politically, legally, and tactically risky; such action would have to be authorized only by the uppermost echelons of the national command authority and is unlikely to be tolerated.¹¹⁶

The "bottom line" for assessing the impact of the Chemical Weapons Convention on possible use of non-lethal chemicals remains, therefore, shrouded in some uncertainty. Clearly, no chemicals, including non-lethal riot control agents, can be utilized "as a method of warfare." Likewise, any effort to test the limits of that prohibition—such as considering possible applications of NLW riot control agents in near-combat situations—would be controversial and fraught with political and strategic peril. Most of the world would not accept as legitimate any meaningful introduction of NLW chemicals into a theater of war, and the eventual retaliation might overwhelm whatever temporary tactical advantage was obtained by the first user. The treaty does not similarly constrain law enforcement applications of non-lethal chemicals, but neither does it offer much assistance in attempting to segregate the military from the police applications in close cases.¹¹⁷

2. Biological Weapons Convention

A similar, but less textually-based, story emerges from analysis of the CWC's predecessor, the 1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (Biological Weapons Convention or BWC).¹¹⁸ The BWC predated the CWC by two

115. Exec. Order No. 11,850, 3 C.F.R. 980 (1971-1975), *reprinted in* 50 U.S.C. § 1512 (2003).

116. Winthrop, *supra* note 105, at 16-19; Nicholas Wade & Eric Schmitt, *U.S. Use of Tear Gas Could Violate Treaty, Critics Say*, N.Y. TIMES, Apr. 5, 2003, at B13.

117. CFR TASK FORCE 3, *supra* note 21, at 31-32; W. Hays Parks, Non-Lethal Weapons: Musings from Experience, Presentation to the Council on Foreign Relations NLW Task Force (Sept. 8, 2003) (observing that any effort to re-open the CWC or to clarify or relax its limitations on NLW would inspire other countries to proffer their own ideas about amending the treaty in ways the U.S. would dislike) (on file with the Georgetown Journal of International Law).

118. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, *opened for signature*

LETHAL AND NON-LETHAL WEAPONS

decades; reflecting its era, the earlier instrument is vastly shorter, lacking richly-detailed definitions, schedules of covered substances, elaborate verification protocols, and consideration of diverse scenarios for possible legitimate uses of biological agents.¹¹⁹

The BWC states simply: “[e]ach State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain . . . [m]icrobial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes.”¹²⁰ The treaty therefore applies equally to lethal and to non-lethal biological agents; it makes no special provision for conceivable biological “riot control agents” or other less-noxious breeds of bugs. The outstanding question—unadorned in the treaty’s text—is whether the permission for “prophylactic, protective or other peaceful purposes” could be stretched to embrace microbes used for non-war, but war-related or law enforcement, applications.

There is little real authority on this topic and, to date, little discussion of it; likewise, few people have systematically considered the

Apr. 10, 1972, 26 U.S.T. 583, 1015 U.N.T.S. 163 (entered into force Mar. 26, 1975) [hereinafter BWC].

The difference between a “chemical” weapon and a “biological” weapon is elusive. In general, a biological weapon (such as anthrax or smallpox) relies upon living creatures (usually microscopic) or infectious materials derived from them (or on artificially-created analogues), which reproduce and cause a “disease” in the targeted person, plant, or animal. A chemical weapon (such as sarin or mustard gas), in partial contrast, uses a substance with direct toxic effects, generally not causing a communicable illness. A “toxin” weapon (such as rattlesnake venom or botulin) is a sort of middle ground—it employs poisonous substances extracted from living things or created in a laboratory. The CWC and BWC therefore overlap to some extent; the legal pigeonholes do not precisely correspond to the vagaries of nature. *See generally* Flowerree, *supra* note 93, at 999; Erhard Geissler, *New Assessments of the Potential Value of BW and TW Agents*, in *STRENGTHENING THE BIOLOGICAL WEAPONS CONVENTION BY CONFIDENCE-BUILDING MEASURES* (Erhard Geissler ed., 1990); Lawler, *supra* note 93.

119. There have been repeated efforts to strengthen the BWC by grafting onto it provisions related to declarations about ambiguous activities, inspections of suspicious locations, and creation of institutional structures comparable to those of the CWC. Most recently, these negotiations have been blocked by opposition from the United States, concerned about intrusions upon private and governmental secrecy. *See* Jonathan B. Tucker, *The BWC New Process: A Preliminary Assessment*, *NONPROLIFERATION REV.*, Spring 2004, at 27-33; *Briefing Paper on the Status of Biological Weapons Nonproliferation*, ACA ISSUE BRIEF (Arms Control Association, Wash., D.C.), Sept. 2002; John R. Bolton, Remarks at Tokyo America Center: The U.S. Position on the Biological Weapons Convention: Combating the BW Threat (Aug. 26, 2002), *available at* <http://www.state.gov/t/us/rm/13090/htm>.

120. BWC, *supra* note 118, art. I, 26 U.S.T. at 587, 1015 U.N.T.S. at 166.

possibility of genetically-engineered microbes deliberately dispersed in an anti-materiel role. The treaty mostly contemplates bugs and toxins that counteract living things by causing a disease or interfering with life processes. How should it deal with supercaustics or super-biodegraders?¹²¹

3. Convention on Certain Conventional Weapons

A third treaty reveals a different aspect of the emerging NLW story: how the world community sometimes deals with selected weaponry that it considers particularly loathsome, regardless of the device's non-lethal character. The 1980 Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects (Convention on Certain Conventional Weapons or CCW)¹²² governs, through a series of protocols which each party may opt to join separately, a Pandora's box of nasty or inhumane weapons such as landmines, booby traps, and incendiary devices.¹²³

121. See Fidler, *The International Legal Implications of "Non-Lethal" Weapons*, *supra* note 3, at 70-71 (concluding that the BWC bars anti-materiel biological agents, as well as those that attack living things). The U.S. legislation passed to implement the treaty—regarded as a major expression of state practice under the treaty—is explicit in outlawing even anti-materiel non-lethal BW. See *infra* text accompanying notes 146-48.

122. Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, *opened for signature* April 10, 1981, 1342 U.N.T.S. 137, 19 I.L.M. 1523 (entered into force Dec. 2, 1983) [hereinafter CCW].

123. The treaty, to which ninety-seven states, including the United States, are party, is an umbrella that now covers five distinct protocols, each of which may be joined individually: (1) prohibiting weapons that employ fragments undetectable in the human body via X-rays; (2) regulating the use of landmines, booby traps, and associated devices; (3) limiting weapons that are primarily designed to set fires or to cause burn injuries; (4) banning blinding laser weapons; and (5) addressing unexploded ordnance, the explosive remnants of war. See <http://www.ccw-treaty.com/> (last visited Mar. 25, 2004).

Protocol II, as amended in 1996, deals with landmines, as does the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction, Sept. 18, 1997, 2056 U.N.T.S. 211, 241-44. Landmines, although commonly designed for lethal effect, could also be engineered as NLW, and these treaties apply to such devices that incapacitate or injure, as well as those that kill. *Id.* art. 2.1, 2056 U.N.T.S. at 242 (explicitly covering mines that "incapacitate"); CCW, *supra* note 122, art. 2, Protocol on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices, 1342 U.N.T.S. at 168, 19 I.L.M. at 1529 (implicitly covering even non-lethal mines) [hereinafter CCW Protocol II]. See Fidler, *The International Legal Implications of "Non-Lethal" Weapons*, *supra* note 3, at 68-69; Mark Hewish & Rupert Pengelley, *In Search of a Successor to the Anti-Personnel Landmine*, *JANE'S INT'L DEF. REV.*, Mar. 1, 1998, at 30.

LETHAL AND NON-LETHAL WEAPONS

Protocol IV to the treaty, concluded in 1995, confronts blinding laser weapons.¹²⁴ It is a response to the impending proliferation of laser devices of various sorts on the battlefield. Such devices can perform a number of functions, including range-finding, target designating, and potentially blinding enemy soldiers.¹²⁵ Under the Protocol, “[i]t is prohibited to employ laser weapons specifically designed, as their sole combat function or as one of their combat functions, to cause permanent blindness to unenhanced vision, that is to the naked eye or to the eye with corrective eyesight devices.”¹²⁶ The Protocol deals only with systems that create irreversible, uncorrectable blindness and that do so deliberately, specifying that “[b]linding as an incidental or collateral effect of the legitimate military employment of laser systems, including laser systems used against optical equipment, is not covered by the prohibition of this Protocol.”¹²⁷ Related laser systems, such as temporary “dazzlers,” intended to disorient and cause temporary loss of vision, are therefore outside the scope of the CCW.¹²⁸

Protocol IV thus reflects a growing global consensus—a sentiment also appreciated in internal United States government policy¹²⁹—that some forms of non-lethal combat are no longer acceptable. Even where the weapon is exquisitely “precise,” in the sense of being targeted on a particular individual, and even when it results in “merely” a horrific injury, rather than in death, this particular non-lethal weapon is widely

124. Additional Protocol to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Protocol on Blinding Laser Weapons, July 30, 1998, 35 I.L.M. 1218 [hereinafter CCW Protocol IV]. Currently there are seventy-nine parties to Protocol IV; the United States is not a party.

125. Scott Gourley, *Making Light Legal*, JANE'S DEF. WKLY, May 24, 2000, at 22-26 (describing multiple kinds of uses of laser systems on the modern battlefield); see also FUTURE WAR, *supra* note 6, at 59-61 (recounting use of laser target designators as NLW in Somalia, where some hostile forces were driven to surrender when they realized they were caught in the unique red or green laser light, even before any shots were fired); LEWER & SCHOFIELD, *supra* note 3, at 91-95.

126. CCW Protocol IV, *supra* note 124, art. 1, 35 I.L.M. at 1218.

127. *Id.* art. 3, 35 I.L.M. at 1219.

128. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 28-29; see also Agreement on the Prevention of Dangerous Military Activities, June 12, 1989, U.S.-U.S.S.R., art. IV, 28 I.L.M. 877, 882 (bilateral agreement to notify each other, and to follow appropriate safety measures, before using a laser that “could cause harm to personnel or damage to equipment of the armed forces” of the other party).

129. News Release, Office of Assistant Secretary of Defense, DoD Announces Policy on Blinding Lasers (Sept. 1, 1995). U.S. policy bars lasers “specifically designed to cause permanent blindness” but considers other types of laser systems (for detection, targeting, communications, etc.) “absolutely vital to our modern military.” *Id.*

reviled, and now legally barred.¹³⁰

4. Law of Armed Conflict

In addition to these individual arms control treaties, the corpus of the law of armed conflict—both customary international law¹³¹ and broadly applicable treaties¹³²—imposes other noteworthy limitations.¹³³ These more general standards apply to all weapons, lethal and non-lethal alike, even those (such as the acoustic, electric, netting, and blunt trauma projectiles noted above) that have not yet been subjected

130. Many people find this outcome surprising—even bizarre—that it would be legal in some combat circumstances to kill an enemy soldier, but not to do lesser damage, such as blinding him. See Fred Reed, *All Weapons Produce Grisly Results*, NAVY TIMES, Oct. 23, 1995, at 70 (arguing against the “irrationality” of opposing some weapons as less humane than others, and asking why, if we are willing to inflict large-scale deaths, we would deem it immoral to inflict individual blindness).

131. RESTATEMENT (THIRD) OF FOREIGN RELATIONS § 102(2) (1986) (customary international law “results from a general and consistent practice of states followed by them from a sense of legal obligation;” it binds countries independent of their participation in or avoidance of any particular treaty).

132. Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Aug. 12, 1949, 6 U.S.T. 3114, 75 U.N.T.S. 31; Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, Aug. 12, 1949, 6 U.S.T. 3217, 75 U.N.T.S. 85; Geneva Convention Relative to the Treatment of Prisoners of War, Aug. 12, 1949, 6 U.S.T. 3316, 75 U.N.T.S. 135; Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287; see Protocol Additional to the Geneva Conventions of 12 Aug. 1949, and Relating to the Protection of Victims of International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Protocol I to the Geneva Conventions]; Protocol Additional to the Geneva Conventions of 12 Aug. 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 609 [hereinafter Protocol II to the Geneva Conventions]. The United States is a party to all four 1949 conventions, but not to the two 1977 additional protocols.

133. Among the earliest modern rules of warfare was the ban on bullets with soft or expanding heads, known as “dum-dum” bullets, which were reviled because they cause so much damage and pain to the human body. *Hague Declaration Concerning Expanding Bullets, July 29, 1899*, 1 SUPP. AM. J. INT’L L. 155-59 (1907). While this is hardly a “non-lethal” technology, it is relevant to this Article’s investigation because these arms may find application in some contemporary counter-terrorist applications (for example, in an airplane hijacking crisis, where an ordinary bullet fired at close range might go right through the body of a targeted person and disastrously puncture the skin of the aircraft; a dum-dum bullet in contrast, is more likely to stay inside the body). The 1899 treaty applies only to international armed conflict, so bullets with expanding heads may lawfully be used in MOOTW. See Robin Coupland & Dominique Loye, *The 1899 Hague Declaration Concerning Expanding Bullets: A Treaty Effective for More Than 100 Years Faces Complex Contemporary Issues*, 85 INT’L REV. RED CROSS 135 (2003). The United States is not a party to the 1899 treaty, but U.S. officials have taken the position that the United States will generally comply with its terms.

LETHAL AND NON-LETHAL WEAPONS

to any dedicated treaty regime such as the CWC, BWC, or CCW.¹³⁴

The most important relevant criterion here is the imperative of avoiding “superfluous injury” and “unnecessary suffering.”¹³⁵ Obviously, in any war, the parties deliberately inflict upon each other a great deal of pain. Pain is ordinarily inherent in the effort to bend the adversary to your will. But this agony is not without limit; the legitimate objective is only to cause the enemy forces to submit. Anything not designed and executed with that objective may be “unnecessary” and therefore “excessive” and illegal. Such a subjective standard is all but impossible to quantify, and it is often difficult to assess in any clear fashion at all. Nevertheless, the legal standard remains as a touchstone against which any weapon, including each NLW, must be assessed.¹³⁶

A second crucial principle of international humanitarian law is that of discrimination or distinction: a valid weapon must be designed and employed in a fashion that enables it to be sufficiently precise, to attack only legitimate targets. It must differentiate, for example, between civilians and combatants, between a fighting force and those who are exempt from attack (e.g., medical personnel, individuals who are

134. The “Martens Clause,” a well-accepted proposition of customary international law, specifies that even if a particular weapon (especially a newly developed type of weapon) is not specifically covered by any existing treaty or customary law, civilians and combatants nonetheless remain under the protection of overarching humanitarian principles. Any weapon that is abhorrent to public conscience is therefore automatically precluded. Robin Coupland & Dominique Loye, *Legal and Health Issues: International Humanitarian Law and the Lethality or Non-Lethality of Weapons*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, § 7.2; *see also* Protocol I to the Geneva Conventions, *supra* note 132, art.1.2 (incorporating Martens Clause into Geneva Conventions).

135. Protocol I to the Geneva Conventions, *supra* note 132, art. 35.2 (“It is prohibited to employ weapons, projectiles and materiel and methods of warfare of a nature to cause superfluous injury or unnecessary suffering.”); Robin M. Coupland, *Abhorrent Weapons and “Superfluous Injury or Unnecessary Suffering”*: *From Field Surgery to Law*, 315 BRIT. MED. J. 1450 (1997); Robin M. Coupland, *The Effect of Weapons: Defining Superfluous Injury and Unnecessary Suffering*, MED. & GLOBAL SURVIVAL, Mar. 1996, available at <http://www.ippnw.org/MGS/V3Coupland.html> [hereinafter Coupland, *The Effect of Weapons*].

136. *Joint Concept*, *supra* note 5, at A2; LEWER & SCHOFIELD, *supra* note 3, at 83-91; Siniscalchi, *supra* note 5, at 139 (NLW attempt to “humanize” armed conflict, consistent with the doctrine of just war). The International Committee of the Red Cross has proposed to quantify the definition of superfluous injury and unnecessary suffering, focusing on factors such as field mortality of more than 25%, hospital mortality of more than 7%, and infliction of more than 10% grade 3 wounds among survivors. Coupland, *The Effect of Weapons*, *supra* note 135; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 86-88; Wallace, *supra* note 7, at 141, 157-61.

surrendering, or those already rendered *hors de combat*).¹³⁷ In some large measure, the inability to be sufficiently precise—the fact that they target wide areas or cannot be adequately focused on belligerents—underpins the general antipathy to chemical or biological weapons (which may drift uncontrollably from a battlefield into a city),¹³⁸ to anti-personnel landmines (which may remain active for years, exploding when triggered by a farmer tilling a field, long after the soldiers have marched away),¹³⁹ and to nuclear weapons (which generate such massive destruction that even distant non-combatants are inevitably implicated).¹⁴⁰

Corollary to these substantive standards is the procedural obligation for each country to carefully assess the legitimacy of each of its weapons.¹⁴¹ Under Protocol I Additional to the 1949 Geneva Conventions,¹⁴² a country is required, before deploying—and certainly before using—a new type of weapon, to evaluate in good faith its conformity with the applicable rules of humanitarian law. It must ascertain, *inter alia*, that the device will not conflict with any applicable arms control treaty, that it will not cause unnecessary suffering, and that it can be deployed in an acceptably discriminatory fashion. The United States, for example, routinely subjects new weapons proposals to legal scrutiny

137. Parks, *supra* note 25, at 113-68; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 84-86; see Siniscalchi, *supra* note 5, at 139 (suggesting that some NLW may be deemed less discriminating, because they are designed to engage large groups of people simultaneously, including both belligerents and surrounding civilians).

138. John Ellis van Courtland Moon, *Controlling Chemical and Biological Weapons Through World War II*, in 2 ENCYCLOPEDIA OF ARMS CONTROL & DISARMAMENT, *supra* note 93, at 657; Richard Nixon, Statement on Chemical and Biological Defense Policies and Programs, Nov. 25, 1969, 1969 PUB. PAPERS 968-69 (1971) (rejecting biological warfare because of its “massive, unpredictable, and potentially uncontrollable consequences”).

139. Gino Strada, *The Horror of Landmines*, SCI. AM., May 1996, at 4; INTERNATIONAL CAMPAIGN TO BAN LAND MINES, LANDMINE MONITOR REPORT 2003: TOWARD A MINE-FREE WORLD (2003).

140. See Advisory Opinion, Legality of the Threat or Use of Nuclear Weapons, 1996 I.C.J. 226 (July 8); Advisory Opinion, Legality of the Use by a State of Nuclear Weapons in Armed Conflict, 1996 I.C.J. 66 (July 8) (the International Court of Justice addressing the very limited circumstances under which it might be lawful to use nuclear weapons).

141. Duncan, *supra* note 9, at 26-29; Coupland & Loye, *supra* note 134, § 7.6.

142. Protocol I to the Geneva Conventions, *supra* note 132, art. 36:

In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.

LETHAL AND NON-LETHAL WEAPONS

both at the stage where research and development are being undertaken and at the end of the evolutionary process, when production and deployment would be authorized.¹⁴³ Non-lethal weapons from lasers to pepper spray to acoustic waves have undergone and survived this gauntlet.¹⁴⁴

These critical precepts of the law of armed conflict are instructive for the evolving consideration of new non-lethal weapons, but they are not always as definitive as one might like. Many of the principles are problematic enough even within their traditional spheres, and they become even more strained when adapting to the unprecedented challenges of asymmetric warfare, modern super-terrorism, and military operations in urban terrain (MOUT). For example, the fundamental requirement of distinction between civilians and combatants is muddied these days. If non-uniformed fighters mingle with a crowd, stir it into a frenzy, and push it forward toward a U.S. military base, at what point do the unarmed participants in the mob forfeit their protected status by assuming a direct role in hostilities? Even more unsettling, if a VMADS system is employed to clear civilians from an urban area—surely a more benign alternative than destructive house-by-house combat—how could those tactics square with the traditional prohibition against directly targeting civilians and their property?¹⁴⁵

143. U.S. Dep't of Defense, Directive 5000.1: The Defense Acquisition System (May 12, 2003), § E1.1.15, available at <http://www.dtic.mil/whs/directives/corres/html/50001.htm> (last visited Feb. 12, 2005); DoD Directive No. 3000.3, *supra* note 1, § 5.6.2; U.S. Dep't of the Army, Army Regulation 27-53: Review of Legality of Weapons Under International Law (Jan. 1, 1979); Air Force Instruction 51-402, Weapons Review (May 13, 1994); Sec. of Navy Instruction 5000.2B, Implementation of Mandatory Procedures for Major & Non-Major Defense Acquisition Programs & Major & Non-Major Information Technology Acquisition Programs (Dec. 6, 1996), available at <http://www.ar.navy.mil/aosfiles/tools/ipt/html/pdf/38.pdf>.

144. Hugh R. Overholt & W. Hays Parks, *Memorandum of Law: The Use of Lasers as Antipersonnel Weapons*, Sept. 29, 1988, reprinted in *ARMY LAW.*, Nov. 1988, at 3; Joseph A. Rutigliano Jr., Memorandum for the Record: Legality of Oleoresin Capsicum (OC) Under the Biological Weapons Convention and Its Implementing Legislation, JA02 (U.S. Dep't of the Navy, Office of the Judge Advocate General, Int'l & Operational Law Division), Oct. 22, 2002; J.P. Winthrop, *Preliminary Legal Review of Proposed Acoustic Energy Non-Lethal Weapon Systems* (U.S. Dep't of the Navy, Office of the Judge Advocate General, Int'l & Operational Law Division, National Security Law Branch), May 26, 1998; Coppernoll, *supra* note 40, at 118 (noting several legal reviews of non-lethal weapons completed by Navy JAG office).

145. Michael N. Schmitt, *The Impact of High and Low-Tech Warfare on the Principle of Distinction 2-3* (Nov. 2003) (Harvard Program on Humanitarian Policy and Conflict Research, International Humanitarian Law Research Initiative Briefing Paper); Human Rights Watch, Briefing Paper, *International Humanitarian Law Issues in a Potential War in Iraq 5-6* (Feb. 20, 2003), available at <http://www.hrw.org/backgrounders/arms/iraq0202003.htm>; Human Rights Watch,

B. *U.S. Law on Non-Lethal Weapons Development*

In addition to these international law obligations, one domestic U.S. statute relevant to non-lethal weapons must be highlighted. Under the Biological Weapons Anti-Terrorism Act of 1989, as amended, the United States is even more constrained regarding research and development of biological NLW than are other members of the BWC regime. This statute provides criminal penalties (fines and up to life imprisonment), injunctions, and forfeiture for developing, producing, stockpiling, transferring, acquiring, retaining, or possessing any biological agent, toxin, or delivery system for use as a weapon, except for “prophylactic, protective, or other peaceful purposes.”¹⁴⁶

The applicable terms are defined very broadly under the statute (“biological agent,” for example, means “any microorganism” or “infectious substance” or “any naturally occurring, bioengineered or synthesized component”).¹⁴⁷ It is clear, therefore, that non-lethal as well as lethal substances are covered; that agents that attack humans, animals, plants, or materiel are all equally barred; and that there is no explicit exemption for anything like “law enforcement” or “riot control agents” as under the CWC and its implementing legislation. Whether any bio-related NLW programs could proceed under the rubric of “prophylactic, protective, or other peaceful purposes” has not been tested. As a consequence, the Joint Non-Lethal Weapons Directorate has stayed completely away from any form of biological NLW.¹⁴⁸

C. *U.S. Law on Police Use of Force*

In contrast to the above two categories, in which the potential military applications of non-lethal weapons are constrained more by

Objects Attacked: The Need for Full Disclosure and Accountability, in NEEDLESS DEATHS IN THE GULF WAR, *supra* note 78 [hereinafter *Objects Attacked: The Need for Full Disclosure and Accountability*], available at <http://www.hrw.org/reports/1991/gulfwar/CHAP4.htm>.

146. 18 U.S.C. §§ 175-178 (2000).

147. 18 U.S.C. § 178 (2000).

148. See David Ruppe, *United States: Pentagon Denies Biological Weapon Charge*, GLOBAL SECURITY NEWSWIRE, May 20, 2002, at http://www.nti.org/d_newswire/issues/newswires/2002_5_20.html#13 (JNLWD has no ongoing projects within the realm of biological NLW, for anti-personnel, anti-materiel, or other purposes; it has occasionally received proposals from Air Force and Navy laboratories for work in those areas, but declines to fund them). *But see* News Release, The Sunshine Project, US Army Patents Biological Weapons Delivery System, Violates Bioweapons Convention (May 8, 2003), available at <http://www.sunshine-project.org/publications/pr/pr080503.html> (watchdog group notes that Army has developed a new grenade that could be used to deliver biological agent).

LETHAL AND NON-LETHAL WEAPONS

international agreements than by federal statutes, the potential police uses of NLW are regulated largely by domestic law: the U.S. Constitution, federal and state legislation, and case law. This Article cannot survey the full array of state and federal legislative and judicial standards and interpretations reining in police violence, but a quick overview of the applicable rules may help elucidate the relevant principles that will guide law enforcement employment of non-lethal arms.¹⁴⁹

The analysis begins with *Tennessee v. Garner*, the watershed 1985 case in which the Supreme Court decided that police may not use deadly force to prevent the flight of an apparently unarmed suspected felon, unless there is probable cause to believe that the suspect presents a significant threat of death or serious physical injury to the officer or others.¹⁵⁰ The Fourth Amendment's prohibition on unreasonable seizures, the Court ruled, requires a balancing between the Government's interest in effective law enforcement versus the individual's interest in liberty. If a non-dangerous individual is suspected of a serious, but relatively less hostile, offense, police may not shoot him to prevent his escape.¹⁵¹

This finding was extended four years later in *Graham v. Connor*,¹⁵² where the Court declared that *all* claims that law enforcement officers have employed excessive force (deadly or otherwise) in making an arrest, investigatory stop, or other seizure of a free citizen are to be evaluated under the Fourth Amendment's "reasonableness" standard.¹⁵³ This delicate and difficult balancing requires careful attention to the amount, type, and duration of coercion applied, the importance of the police mission in the particular case, and the individual's loss of

149. See generally MICHAEL AVERY ET AL., POLICE MISCONDUCT: LAW AND LITIGATION §§ 2:18-2:22 (3d ed. 2003).

150. *Tennessee v. Garner*, 471 U.S. 1, 11 (1985); see also *Vera Cruz v. Escondido*, 139 F.3d 659, 660 (9th Cir. 1997) (defining "deadly force").

151. *Garner*, 471 U.S. at 11 ("It is no doubt unfortunate when a suspect who is in sight escapes, but the fact that the police arrive a little late or are a little slower afoot does not always justify killing the suspect.")

152. *Graham v. Connor*, 490 U.S. 386, 395 (1989).

153. A different test, governed by the Eighth Amendment and the Fourteenth Amendment substantive due process clause, applies to governmental uses of force against incarcerated individuals. There, too, lethal as well as non-lethal weapons may be employed in some circumstances, but the balance is struck differently, and the custodians' motivations (good faith, malice, intent to inflict punishment) become more relevant. See AVERY ET AL., *supra* note 149, § 2:20; *Whitley v. Albers*, 475 U.S. 312, 327 (1986).

autonomy and bodily integrity.¹⁵⁴

These cases helped inspire police forces across the country to explore alternatives to traditional lethal force with extra vigor. If ordinary firearms were now judged inappropriate for detaining many fleeing suspects, what additional tools might be available to assist in apprehending and subduing suspects?¹⁵⁵

In articulating these legal principles, the Court was careful to note that the determination of “reasonableness” in applying force posed a unique challenge for police and for judicial review. No formulaic “cookie-cutter” approach exists for these assessments. Rather, each case must be analyzed individually, under a “totality of the circumstances” approach.¹⁵⁶ Furthermore, police should be afforded a benefit of the doubt in close cases, especially where they were compelled to make split-second decisions under the pressure of incomplete information and potential hazard to themselves and others.¹⁵⁷

Most notably, the case law has preserved a fine point of interpretation subtly different from the international legal standards noted above. Police are constrained to use only “reasonable” levels of force, but not necessarily the “least intrusive” means. In a situation where it might be considered “reasonable” to choose any of a variety of possible approaches (and to employ accordingly varied levels and kinds of force), courts have not insisted that the officers start with the “lowest”

154. *Graham*, 490 U.S. at 397 (explaining that the test is one of “objective reasonableness,” in light of all the facts and circumstances known to the police at the time, rather than focusing on the motivations or the benign or hostile intentions of the officer).

155. *FUTURE WAR*, *supra* note 6, at 77. The *Garner* Court noted approvingly that many states—and most individual police forces—had already barred the use of deadly force against non-dangerous fleeing felons; only 7.5% of departmental and municipal police forces had policies seeking to preserve the opportunity to use deadly force to effect an arrest of any felon. 471 U.S. at 15-19.

156. *Garner*, 471 U.S. at 8-9; *Graham*, 490 U.S. at 396; *Bell v. Wolfish*, 441 U.S. 520, 559 (1979) (“The test of reasonableness under the Fourth Amendment is not capable of precise definition or mechanical application.”); *Ford v. Childers*, 855 F.2d 1271, 1274 (7th Cir. 1988) (en banc).

157. *Graham*, 490 U.S. at 396-97 (“The calculus of reasonableness must embody allowance for the fact that police officers are often forced to make split-second judgments—in circumstances that are tense, uncertain, and rapidly evolving—about the amount of force that is necessary in a particular situation.”); *Roy v. Inhabitants of Lewiston*, 42 F.3d 691, 694-95 (1st Cir. 1994) (holding that it was reasonable for police to use lethal firearms, and not to be equipped with chemical mace).

The police may also benefit from a “qualified immunity” from suit, protecting an officer who mistakenly, but reasonably, believes that a particular exercise of force would be legal under the circumstances. *AVERY ET AL.*, *supra* note 149, § 2:19; *Saucier v. Katz*, 533 U.S. 194 (2001); *Anderson v. Creighton*, 483 U.S. 635 (1987).

LETHAL AND NON-LETHAL WEAPONS

level of compulsion (however that ladder of violence might be defined) and work their way up only when the less powerful tools prove unavailing. Of course, there may not be much leeway between the “lowest” level of force that would suffice to get the job done and a “reasonable” approach, but U.S. courts are now quite clear that the test is “reasonableness,” not “minimal force.”¹⁵⁸

This somewhat murky Supreme Court guidance has, of course, failed to anticipate or resolve all subsequent controversies, and cases frequently test the application of various forms of lethal and non-lethal force. Regarding pepper spray, for example, there is no case law supporting the proposition that use of OC is *per se* excessive, but in selected circumstances, even this non-lethal form of police coercion may be deemed unreasonable. If the targeted person is not resisting arrest or is sprayed repeatedly, or if police fail to take appropriate measures to ameliorate the effects of the spray, courts find liability.¹⁵⁹

158. *Forrester v. City of San Diego*, 25 F.3d 804, 807-08 (9th Cir. 1994). The police used “pain compliance” techniques, via “nonchakus” (two wooden sticks, connected by a cord, wrapped around a demonstrator’s wrist) to clear trespassing anti-abortion protesters. *Id.* When challenged by the assertion that it would have been more reasonable to drag or carry the protesters away, the Ninth Circuit ruled:

Police officers, however, are not required to use the least intrusive degree of force possible. Rather, as stated above, the inquiry is whether the force that was used to effect a particular seizure was reasonable, viewing the facts from the perspective of a reasonable officer on the scene. *See Graham*, 490 U.S. at 396. Whether officers hypothetically could have used less painful, less injurious, or more effective force in executing an arrest is simply not the issue.

Id. at 808; *see also* *Scott v. Henrich*, 978 F.2d 481 (9th Cir. 1992); *withdrawn and reissued*, 39 F.3d 912 (9th Cir. 1994); *Illinois v. Lafayette*, 462 U.S. 640 (1983); *Plakas v. Drinski*, 19 F.3d 1143, 48 (7th Cir. 1994), *cert. denied*, 115 S. Ct 81 (1994) (“[W]here deadly force is otherwise justified under the Constitution, there is no constitutional duty to use non-deadly alternatives first.”); *Brewer v. City of Napa*, 210 F.3d 1093, 1097 (9th Cir. 2000) (upholding jury instruction to consider “general reasonableness” of using police dogs without specifying alternative courses of action); *Forrett v. Richardson*, 112 F.3d 416, 420 (9th Cir. 1997) (“The Fourth Amendment does not require law enforcement officers to exhaust every alternative before using justifiable deadly force.”); *Hegarty v. Somerset County*, 53 F.3d 1367 (1st Cir. 1995).

159. *Vinyard v. Wilson*, 311 F.3d 1340, 1348 (11th Cir. 2002) (unreasonable to use pepper spray against arrestee whose wrists were handcuffed behind her back and who was placed in a police car with protective screen between her and the officer); *Park v. Shiflett*, 250 F.3d 843 (4th Cir. 2001) (finding it excessive when police twice sprayed unresisting woman with pepper spray at very short range); *Headwaters Forest Defense v. County of Humboldt*, 276 F.3d 1125 (9th Cir. 2002) (finding it unreasonable to apply pepper spray with Q-tips directly into the eyes, to spray at very close range, and to refuse to provide water to wash out the eyes of protesters who were passively resisting arrest, when other means would have sufficed to effectuate arrest); *LaLonde v. County of*

Likewise, police are generally allowed to employ taser electric guns, but in some circumstances, it may be unreasonable to do so.¹⁶⁰ Bean-bag munitions (or other reduced impact blunt trauma projectiles)¹⁶¹ and police dogs¹⁶² are analyzed in a similar fashion: case-by-case determinations assess whether law enforcement relied unreasonably upon these tools. Constraint mechanisms—handcuffs, hogties, etc.—also pose the same inquiry; sometimes, but by no means always, it will be deemed reasonable to confine a particular individual in that ordinarily non-lethal fashion.¹⁶³

Riverside, 204 F.3d 947, 961 (9th Cir. 2000) (“[T]he use of such weapons [e.g., pepper sprays; police dogs] may be reasonable as a general policy to bring an arrestee under control, but in a situation in which an arrestee surrenders and is rendered helpless, any reasonable officer would know that a continued use of the weapon or a refusal without cause to alleviate its harmful effects constitutes excessive force.”); *Gaddis v. Redford Township*, 364 F.3d 763, 774 (6th Cir. 2004) (purpose of pepper spray “is to give police effective options short of lethal force that can be used to take custody of an armed suspect;” expressing doubt that use of non-lethal force against an armed suspect would constitute excessive force).

160. *See Russo v. Cincinnati*, 953 F.2d 1036, 1045 (6th Cir. 1992) (holding that repeated use of taser was not excessive, even when the suspect lay at bottom of stairwell and posed no immediate threat to officers).

161. *Bell v. Irwin*, 321 F.3d 637, 640 (7th Cir. 2003) (record does not establish whether bean-bag round should be classified as lethal, but where the alternative would have been use of ordinary firearms, the accused “should have thanked rather than sued the officers” who used the NLW munitions); *Deorle v. Rutherford*, 272 F.3d 1272 (9th Cir. 2001), *cert. denied*, 536 U.S. 958 (2002) (objectively unreasonable to shoot, even with beanbag round, unarmed, mentally disturbed man who posed no flight risk or threat to officers).

162. *Jarrett v. Town of Yarmouth*, 331 F.3d 140 (1st Cir. 2003) (per curiam) (police dog trained in “bite and hold” technique does not constitute deadly or per se unreasonable force); *Watkins v. City of Oakland*, 145 F.3d 1087, 1093 (9th Cir. 1998) (dog is less dangerous than police baton, but where duration of dog’s bite was excessive and police improperly encouraged continuation of attack, use of force was unreasonable); *Priester v. City of Riviera Beach*, 208 F.3d 919 (11th Cir. 2000) (police allowing dog to bite for two minutes was unreasonable); *Vathekan v. Prince George’s County*, 154 F.3d 173, 179 (4th Cir. 1998) (failure to warn that dog would be loosed was unreasonable).

163. *AVERY ET AL.*, *supra* note 149, § 2:19; *Cruz v. City of Laramie*, 239 F.3d 1183 (10th Cir. 2001) (use of “hog-tie” (binding ankles and wrists together behind the person’s back) is not per se unreasonable, but is excessive where person’s diminished capacity is apparent and makes use of constrictions more risky); *Gutierrez v. City of San Antonio*, 139 F.3d 441 (5th Cir. 1998) (hog-tying a substance-abusing person and placing him face down in the back seat of a police car was unreasonable); *Phillips v. Milwaukee*, 123 F.3d 586 (7th Cir. 1997) (police used reasonable force to restrain man with hand and ankle cuffs in prone position); *Cottrell v. Caldwell*, 85 F.3d 1480 (11th Cir. 1996) (not unreasonable for police to restrain psychologically disturbed man in police car with his feet on the rear seat and his head in the space between the front and rear seats, where he suffocated due to positional inability to breathe); *Garrett v. Athens-Clarke County, Georgia*, 378 F.3d 1274 (11th Cir. 2004) (per curiam) (not excessive, where defendant strongly resists arrest, to use pepper spray and to fetter him by tying his wrists less than twelve inches from his

LETHAL AND NON-LETHAL WEAPONS

Car chases demand a rather different sort of analysis because while the pursuit is underway, there has been no “seizure” of the individual. Only if police deliberately terminate a suspect’s flight, such as via a roadblock (whether accomplished through traditional measures or through modern NLW such as netting systems), would the Fourth Amendment apply.¹⁶⁴

Finally, courts are reluctant to second-guess police departments’ procurement decisions regarding the type of equipment to field. Arming a police force only with customary lethal weapons does not violate the Constitution, even in situations where NLW would have enabled use of better, more deft techniques. The administrative and budgetary choices not to purchase the equipment that would have created a particular—and, in hindsight, quite worthwhile—law enforcement capability do not rise to the level of unreasonable.¹⁶⁵

Overall, the domestic U.S. law on police uses of force against non-incarcerated individuals relies upon an ineffable Fourth Amendment balancing test, demanding comparison of the competing values of personal liberty and governmental law enforcement. There can be no definitive formula for assessing the lawfulness of particular weaponry—lethal or non-lethal—as any tool could be wielded in an excessive fashion in a particular situation. But courts generally provide a “margin of appreciation” for the predicament of law enforcement

ankles); *Carter v. Denison*, No. 03-16509, 2004 WL 1895018 (9th Cir. 2004) (police were reasonable in using OC spray and hand and ankle cuffs on clearly delusional woman who resisted them and who posed an immediate threat to safety of officers).

164. *AVERY ET AL.*, *supra* note 149, § 2:21; *County of Sacramento v. Lewis*, 523 U.S. 833, 853-54 (1998) (evaluating high-speed chase of motorcycle along 14th Amendment substantive due process criteria, finding no liability unless police demonstrated arbitrary purpose to cause harm, shocking to the conscience); *Brower v. County of Inyo*, 489 U.S. 593, 599 (1989) (police use of roadblock to stop a car constituted a “seizure;” next step was to evaluate whether that seizure was reasonable under the circumstances); *California v. Hodari D.*, 499 U.S. 621 (1991) (a seizure of a person occurs only when police take custody or the person submits to police authority); *Seekamp v. Michaud*, 109 F.3d 802 (1st Cir. 1997) (police acted reasonably to establish roadblock, even though it resulted in injury to driver); *Cole v. Bone*, 993 F.2d 1328, 1333 (8th Cir. 1993) (not unreasonable for police to use deadly force after roadblocks had failed to stop speeding truck).

165. *Plakas v. Drinski*, 19 F.3d 1143, 1148 (7th Cir. 1994), *cert. denied*, 115 S. Ct. 81 (1994) (“There is, however, not a single precedent which holds that a governmental unit has a constitutional duty to supply particular forms of equipment to police officers.”); *Carswell v. Borough of Homestead*, 381 F.3d 235, 245 (3d Cir. 2004) (“[W]e have never recognized municipal liability for a constitutional violation because of failure to equip police officers with non-lethal weapons.”); *Salas v. Carpenter*, 980 F.2d 299, 310 (5th Cir. 1992) (stating that the U.S. Constitution “does not mandate that law enforcement agencies maintain equipment useful in all foreseeable situations”).

emergencies. Courts do not require reliance upon the “least intrusive” NLW mechanism, so long as the actual force applied by the police rises to the level of “reasonableness.”

IV. THE FBI AND THE DAVIDIANS AT WACO IN 1993

Sections IV through VI survey three representative—if peculiar—circumstances in which military and/or law enforcement authorities in different countries were called upon to apply various quantities of physical force against armed opponents. In each of these confrontations, violence erupted—many people died, and much property was destroyed—and critics have questioned the tactics, weaponry, and timing of the final assault, wondering whether some of the carnage might have been avoided. The following three sections pick apart these three incidents in some detail, focusing especially on the implements wielded by the opposing forces and raising the question of the possible utility of non-lethal weapons, especially new and evolving NLW technologies. In each section, the Article first examines the background to the firefight; then describes the shooting itself; then inquires what difference modern non-lethal devices might have made.

A. *Background on the Waco Confrontation*

A tumultuous religious community known as the Branch Davidians—many labeled it a cult—settled outside Waco, Texas in the 1930s. By 1987, this radical offshoot of the Seventh Day Adventist Church (which emphatically denied any continuing connection) was led by the messianic Vernon Howell, who later changed his name to David Koresh. As the sect grew, and as Koresh’s control became absolute and bizarre, the Branch Davidians developed an apocalyptic theology, with Koresh prophesying the imminent fiery end of the world.¹⁶⁶

The Davidians established their sanctuary, known as Mount Carmel,

166. See generally DICK J. REAVIS, *THE ASHES OF WACO: AN INVESTIGATION passim* (1995); FROM THE ASHES: MAKING SENSE OF WACO *passim* (James R. Lewis ed., 1994); BRAD BAILEY & BOB DARDEN, *MAD MAN IN WACO* 15-149 (1993); CLIFFORD L. LINEDECKER, *MASSACRE AT WACO, TEXAS* 42-153 (1993); JOHN C. DANFORTH, *FINAL REPORT TO THE DEPUTY ATTORNEY GENERAL CONCERNING THE 1993 CONFRONTATION AT THE MT. CARMEL COMPLEX, WACO, TEXAS*, app. A (2000), available at <http://www.apologeticsindex.org/b10a03.html>; U.S. DEP’T OF JUSTICE, *REPORT TO THE DEPUTY ATTORNEY GENERAL ON THE EVENTS AT WACO, TEXAS, FEB. 28 TO APR. 19, 1993*, at 14-17 (1993) (redacted version) [hereinafter *REPORT TO THE DEPUTY A.G. ON WACO*]; *Activities of Fed. Law Enforcement Agencies Toward the Branch Davidians Part 2: Joint Hearings Before the Subcomm. on Crime of the Comm. on the Judiciary and the Subcomm. on Nat’l Sec., Int’l Affairs, and Criminal Justice of the Comm. on Gov’t Reform and Oversight*, 104th Cong., 1st Sess., 156-58 (1996) [hereinafter *Activities Part II*]; Dean M.

LETHAL AND NON-LETHAL WEAPONS

in a series of ramshackle buildings on a seventy-seven-acre compound, home to more than 100 men, women, and children from a variety of countries. Under Koresh's charismatic leadership, they also accumulated an impressive arsenal of \$200,000 worth of weapons, explosives, and equipment in anticipation of a millennial eruption. The inventory included submachine guns, .50 caliber heavy machine guns, hand grenades and a grenade launcher, AK-47 assault rifles, Ruger and AR15/M16 semi-automatic rifles, Beretta semi-automatic pistols, quantities of explosive black powder, and night-vision goggles. Eventually, the accretion of all this firepower—especially the illegal possession of automatic firearms and the purchase of several kits to convert semi-automatic into fully automatic weapons—attracted the attention of federal authorities. At the same time, reports—including some from defecting members of the cult—about Koresh's frequent practice of child sexual abuse also aroused concern.¹⁶⁷

After more than a year of investigation, approximately seventy-five

Kelley, *Waco: A Massacre and Its Aftermath*, FIRST THINGS, May 1995, 22-37, available at <http://www.firstthings.com/ftissues/ft9505/articles/kelley.html>.

167. Regarding the weapons accusations, see U.S. DEP'T OF TREASURY, REPORT OF THE DEP'T OF THE TREAS. ON THE BUREAU OF ALCOHOL, TOBACCO, & FIREARMS INVESTIGATION OF VERNON WAYNE HOWELL, ALSO KNOWN AS DAVID KORESH 73-74 (1993) [hereinafter TREASURY REPORT]; EDWARD S.G. DENNIS, JR., U.S. DEP'T OF JUSTICE, EVALUATION OF THE HANDLING OF THE BRANCH DAVIDIAN STAND-OFF IN WACO, TEXAS, FEB. 28 TO APR. 19, 1993, at 34-35 (1993) (redacted version); *Materials Relating to the Investigation into the Activities of Fed. Law Enforcement Agencies Toward the Branch Davidians: Comm. on the Judiciary Prepared in Conjunction with the Comm. on Gov't Reform and Oversight*, 104th Cong., 2d Sess. 19-26, 213-36 (1996) [hereinafter *Materials Relating*]; LINEDECKER, *supra* note 166, at 8, 21-22, 180-81; REAVIS, *supra* note 166, at 33; Kelley, *supra* note 166. *But see* Moorman Oliver, Jr., *Killed by Semantics: Or Was It a Keystone Kop Kaleidoscope Kaper?*, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 71, 83-84; James R. Lewis, *Showdown at the Waco Corral: ATF Cowboys Shoot Themselves in the Foot*, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 87, 90-92 (describing ATF claims about the Davidians' weapons violations as false or exaggerated).

Regarding the allegations of child abuse and child sexual abuse, see REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 215-27; LINEDECKER, *supra* note 166, at 148-49; BAILEY & DARDEN, *supra* note 166, at 153-54; Gustav Niebuhr & Pierre Thomas, *Abuse Allegations Unproven; Koresh Was Investigated in Texas, California*, WASH. POST, Apr. 25, 1993, at A1; *Activities of Fed. Law Enforcement Agencies Toward the Branch Davidians Part I: Joint Hearings Before the Subcomm. on Crime of the Comm. on the Judiciary and the Subcomm. on Nat'l Sec., Int'l Affairs, and Criminal Justice of the Comm. on Gov't Reform and Oversight*, 104th Cong., 1st Sess., 147-62 (1996) (testimony of Kiri Jewell) [hereinafter *Activities Part I*]. *But see* Lawrence Lilliston, *Who Committed Child Abuse at Waco?*, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 169-73; George Robertson, *Suffer the Little Children*, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 175-80; REAVIS, *supra* note 166, at 229. During the siege, investigators observed that the children remaining inside the Davidian compound seemed to be well cared for.

agents and support personnel of the federal Bureau of Alcohol, Tobacco, and Firearms (ATF) entered the Mount Carmel compound on February 28, 1993, intending to serve an arrest warrant on Koresh and a search warrant for the illegal weaponry.¹⁶⁸ Before the agents reached the front door, the Davidians opened a hailstorm of fire; fusillades of bullets were continuous in both directions for forty-five minutes and sporadic for eighty more. By some estimates, 10,000 rounds of ammunition were expended in the shootout.¹⁶⁹ Four ATF agents were killed and sixteen others were wounded in the ambush; inside the compound, there were five deaths and an unknown number injured, including Koresh. An uneasy truce was brokered, and the federal agents withdrew from Mount Carmel in shock. Shortly thereafter, the ATF requested the assistance of the Federal Bureau of Investigation (FBI), which then assumed leadership responsibility for future dealings with the Davidians. By midnight, more than 300 law enforcement officers were on the scene.¹⁷⁰

168. REAVIS, *supra* note 166, at 34-36 (discussing shortcomings in the affidavit investigators filed with the court to obtain the warrants); *id.* at 138-42; *id.* at 151-61 (describing the ATF entry into the Davidian compound and the subsequent shooting); *Activities Part I*, *supra* note 167, at 221-32, 810-12 (reviewing sufficiency of affidavit); *see also* TREASURY REPORT, *supra* note 167, at 122-28 (discussing sufficiency of the evidence for issuing an arrest warrant on Koresh); John A. Kolman, *A Selective Analysis of Operation Trojan Horse Conducted by the Bureau of Alcohol, Tobacco & Firearms*, reprinted in TREASURY REPORT, *supra* note 167, at B31, B40-44; Final Raid Plan, reprinted in TREASURY REPORT, *supra* note 167, at C25-35; Kelley, *supra* note 166.

169. The issue of who fired the first shot is still disputed, and much of the evidence is equivocal or has long since disappeared. *See* Frontline, *Waco: The Inside Story*, Oct. 17, 1995 (transcript of PBS television broadcast), available at <http://www.pbs.org/wgbh/pages/frontline/waco/view>; REAVIS, *supra* note 166, at 138-42; *Materials Relating*, *supra* note 167, at 50-51; *Activities Part I*, *supra* note 167, at 520-21, 632-33; BAILEY & DARDEN, *supra* note 166, at 173; LINEDECKER, *supra* note 166, at 35; TREASURY REPORT, *supra* note 167, at 96-100.

170. Regarding the details of the February 28 shootout, *see Materials Relating*, *supra* note 167, at 34-56; LINEDECKER, *supra* note 166, at 22-41; BAILEY & DARDEN, *supra* note 166, at 161-77; TREASURY REPORT, *supra* note 167, at 96-103.

Some of the ATF agents did enter the building during the melee, but they were driven back by withering fire, including shots fired through the walls; the agents' rules of engagement prohibited them from firing indiscriminately in situations where they could not see their targets. LINEDECKER, *supra* note 166, at 27, 31; BAILEY & DARDEN, *supra* note 166, at 172.

After-action analyses concluded that the ATF had lost the element of surprise; someone had tipped off the Davidians about the planned raid, and instead of arriving at a time when many of Koresh's men would be working outside the main building, unarmed, the law enforcement team arrived when the group was well-prepared. In addition, federal agents were startled by the number and firepower of the Davidians' weapons, saying they were simply outgunned. *Materials Relating*, *supra* note 167, at 34-44; LINEDECKER, *supra* note 166, at 166; BAILEY & DARDEN, *supra* note 166, at 162-66; *Activities Part I*, *supra* note 167, at 464.

LETHAL AND NON-LETHAL WEAPONS

A fifty-one-day standoff ensued, with FBI negotiators engaged in sporadic, maddeningly frustrating telephone negotiations with Koresh and his subordinates.¹⁷¹ Over the first month, some thirty-five people (twenty-one children and fourteen adults) were allowed by Koresh to leave the compound.¹⁷² No shots were fired by either side throughout the siege, but an array of law enforcement personnel unprecedented in American history assembled outside the compound. On average, 217 FBI agents were present at the site each day, along with perhaps 500 other officers from the ATF, Waco police, the McLennan County Sheriff's office, the Texas Rangers, the U.S. Army, the Texas National Guard, and other agencies.¹⁷³

B. *The Assault: April 19, 1993*

Determined to bring the standoff to a conclusion, the FBI assembled an assault force, medical teams, firefighting equipment, and a variety of military and paramilitary vehicles, including five Combat Engineering Vehicles (CEVs—M60 tanks with booms attached, instead of gun

171. Agreements were occasionally reached, and more were attempted (sometimes through intermediaries such as clergymen, journalists, lawyers, local law enforcement personnel, and the Davidians' family members) to broadcast some of Koresh's messages, to supply milk for the children inside the compound, to provide medical care for the injured, and to release some of the cult members. But far more often, the conversations were elliptical and Koresh's promises were soon broken. *Activities of Fed. Law Enforcement Agencies Toward the Branch Davidians Part 3: Joint Hearings Before the Subcomm. on Crime of the Comm. on the Judiciary and the Subcomm. on Nat'l Sec., Int'l Affairs, and Criminal Justice of the Comm. on Gov't Reform and Oversight*, 104th Cong., 1st Sess., 258-61 (1996) [hereinafter *Activities Part III*] (roster of Koresh's broken promises to evacuate the compound); *id.* at 353 (during the standoff, the FBI held 949 conversations with Koresh and his lieutenants, totaling almost 215 hours); see LINEDECKER, *supra* note 166, at 200, 212-19; REAVIS, *supra* note 166, at 200-14; DENNIS, *supra* note 167, at 6-26; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 10-11, 17, 68-73, 90-97, 194-204, app. C; *Materials Relating*, *supra* note 167, at 103-23.

172. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 11.

173. *Id.* at 10, 228-34; Reavis, *supra* note 166, at 263.

The military presence at Waco was substantial, but subordinate to law enforcement. Under the 1878 Posse Comitatus Act, 18 U.S.C. § 1385, and the Military Assistance to Law Enforcement Act, 10 U.S.C. §§ 371-78, the military is barred from performing direct law enforcement functions (such as conducting searches and seizures) inside the United States, but can act in support of domestic civil authorities by providing training, information, medical support, reconnaissance, maintenance, and advice in extraordinary situations. That augmentation authority can be substantial, in terms of both personnel and equipment. See DANFORTH, *supra* note 166, at 5, 33-46, 125-32, 138-40; *Materials Relating*, *supra* note 167, at 57-102; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, app. B (listing military personnel and equipment present at Waco); REAVIS, *supra* note 166, at 122-23; *Activities Part I*, *supra* note 167, at 346-411, 839-45; TREASURY REPORT, *supra* note 167, at 211-14.

barrels), two M1 Abrams tanks, nine M2AO Bradley fighting vehicles, and two helicopters.¹⁷⁴ At 5:55 a.m. on April 19, the CEVs advanced into the compound, punching holes in the walls of the Davidians' main building and inserting CS tear gas—liquid streams covering approximately fifty feet in fifteen seconds—into first-floor corner rooms. The original plan was to escalate gradually the amount of CS dispensed and to inject it into additional portions of the buildings, incrementally contaminating the compound over forty-eight hours until the Davidians were flushed out. This action was accompanied by oral messages, delivered via loudspeaker and telephone, assuring the Davidians that the FBI was not undertaking a comprehensive assault, and that people who wished to leave the compound could safely do so via passageways cleared through the three-foot-high concertina wire barrier that surrounded the installation.¹⁷⁵

174. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, app. B. By one estimate, the standoff was costing the FBI and ATF \$1 million per week. LINEDECKER, *supra*, note 166, at 189; *see also* Mary Jordan & Sue Anne Pressley, *Cult Leader Wants to Die a Martyr in 'All-Out Firefight,'* WASH. POST, Mar. 9, 1993, at A1 (estimating the total cost to all law enforcement agencies at \$2 million per day); *Activities Part III*, *supra* note 171, at 430 (citing cost of \$5.9 million for the siege).

Some feared that the Davidians might have enough supplies, patience, and internal discipline to be able to hold out for a year or more. Federal authorities contemplated simply waiting indefinitely, but eventually felt they could not and should not delay that long. Negotiations had come to a standstill, with little prospect for a peaceful solution; the welfare of the remaining children in the compound was an ongoing concern; the endurance of the law enforcement teams was stretched; and there was always the possibility that outside groups might arrive and try to aid Koresh. LINEDECKER, *supra* note 166, at 233-35; DENNIS, *supra* note 167, at 57; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 246-48, 260-61 (outlining the President's account of the considerations leading to the decision to proceed into the compound and other considerations taken by the FBI); *Materials Relating*, *supra* note 167, at 138-46; *Activities Part III*, *supra* note 171, at 353-54; *Activities Part I*, *supra* note 167, at 944; Michael Isikoff, *Reno, FBI Took Fatal Gamble*, WASH. POST, Apr. 21, 1993, at A1; BAILEY & DARDEN, *supra* note 166, at 242; DANFORTH, *supra* note 166, at 150-51; Kelley, *supra* note 166; Peter J. Boyer, *Children of Waco*, THE NEW YORKER, May 15, 1995, at 38.

175. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 110-11, 261-63, 276-307; *Activities Part I*, *supra* note 167, at 642-51 (transcript of FBI telephone conversation with Koresh on April 19, explaining the CS procedure); *Frontline, Waco: The Inside Story*, *supra* note 169; DANFORTH, *supra* note 166, at 143-63; *Materials Relating*, *supra* note 167, at 124-46, 462-82; DENNIS, *supra* note 167, at 58-59; LINEDECKER, *supra* note 166, at 235-38; BAILEY & DARDEN, *supra* note 166, at 248-53.

Federal officials debated whether Koresh and the Davidians were suicidal—the evidence, including statements from Koresh, other Davidians, and outside experts, was quite contradictory—and feared that an all-out assault might prompt the most extreme reactions. A more limited move, by gradually inserting tear gas and compelling the inhabitants to exit Mount Carmel, was thought to be less provocative. *Activities Part III*, *supra* note 171, at 354; DENNIS, *supra* note 167, at 6-8, 16, 22, 25-26, 36-39; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 50, 210-14; Isikoff, *supra* note 174; BAILEY & DARDEN, *supra* note 166, at 242-43. *But see* James D. Tabor, *The Waco Tragedy: An*

LETHAL AND NON-LETHAL WEAPONS

The Davidians, however, responded with a barrage of gunshots. The law enforcement officers did not return fire, but the CEVs and Bradley vehicles bashed down more sections of the compound's walls, and grenade launchers shot 389 Ferret rounds with more CS into the buildings.¹⁷⁶ A pause followed, with sputtering attempts at further negotiations and additional injections of CS. The climax occurred shortly after noon. Simultaneous fires erupted in at least three locations inside the facility, and systematic gunfire from inside resumed. The flames, fanned by thirty-mph prairie winds, reached nearly 2000 degrees Fahrenheit; they quickly engulfed the entire structure, and the flimsy Mount Carmel compound essentially burned to the ground inside forty-five minutes. The remains of seventy-five people (fifty adults and twenty-five children), including Koresh, were recovered from the ruins, many of them bearing evidence of having been shot at close range (presumably suicide or execution by other cult members during the fire). Nine Davidians somehow survived the conflagration.¹⁷⁷

C. What Might Have Been

The FBI and the other law enforcement officers on the scene fired

Autobiographical Account of One Attempt to Avert Disaster, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 13 (concluding that Koresh would have surrendered peacefully if the standoff had continued a little while longer); *Materials Relating*, *supra* note 167, at 150-51; Timothy Lynch, *No Confidence: An Unofficial Account of the Waco Incident*, POLICY ANALYSIS (Cato Institute, Wash., D.C.), Apr. 1, 2001, at 1.

The FBI knew the Davidians had gas masks and other methods for protecting themselves from the CS, but believed these would be of limited effectiveness. BAILEY & DARDEN, *supra* note 166, at 250.

176. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 287-90; DANFORTH, *supra* note 166, at 157; Sue Anne Pressley, *Waco Siege Ends in Dozens of Deaths as Cult Site Burns After FBI Assault; Davidians Set Blaze, Officials Say*, WASH. POST, Apr. 20, 1993, at A1; *Materials Relating*, *supra* note 167, at 128-38; REAVIS, *supra* note 166, at 267-78.

177. *Frontline, Waco: The Inside Story*, *supra* note 169; DANFORTH, *supra* note 166, at 169, 177-79; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 111-13, 295-98, 312; *Materials Relating*, *supra* note 167, at 155-63; Pressley, *supra* note 176; BAILEY & DARDEN, *supra* note 166, at 253-57; LINEDECKER, *supra* note 166, at 236-40.

After the fire, investigators recovered 305 firearms from the compound, as well as 1.9 million rounds of ammunition that had been expended by the Davidians or been "cooked off" in the fire and 400,000 rounds of live ammunition. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 309-11; DANFORTH, *supra* note 166, at 175; Memorandum to the Press, from Chris Peacock, Director of Public Affairs, U.S. Dep't of Treas. (July 13, 1995) (on file with the Georgetown Journal of International Law); LINEDECKER, *supra* note 166, at 243; *Activities Part I*, *supra* note 167, at 752-53.

no shots during the April 19 tragedy or throughout the preceding fifty-one-day siege.¹⁷⁸ They were, of course, heavily armed, with an array of powerful tools now standard-issue on SWAT teams, a number of special accouterments for the occasion, and an assortment of non-lethal weapons.¹⁷⁹ For example, “flash-bang” concussion grenades were available for use in any assault; the ATF had thrown some on February 28, and the FBI occasionally applied them during the siege to drive indoors any Davidians who ventured outside into the yard.¹⁸⁰ During the initial engagement, the ATF agents carried non-lethal fire extinguishers with which to spray carbon dioxide at the Davidians’ many dogs, deterring them from attacking.¹⁸¹ The concertina wire barrier also performed as a form of NLW, designed to ensure that the Davidians could not escape the blockade by shooting their way out of the compound and equally to make certain that no outside reinforcements could enter the facility to join Koresh.¹⁸²

178. DENNIS, *supra* note 167, at 35. On several occasions, FBI snipers spotted Koresh at a window of the compound and could have attempted to shoot him; their instructions, however, were to refrain, in favor of continued negotiations. BAILEY & DARDEN, *supra* note 166, at 207-08; Richard J. Davis, Report to Dep’t of Justice & Treas. (Aug. 31, 1993), in U.S. DEP’T OF JUSTICE, RECOMMENDATIONS OF EXPERTS FOR IMPROVEMENTS IN FEDERAL LAW ENFORCEMENT AFTER WACO 22-23 (1993).

Some analysts concluded that the FBI did fire shots into the Davidians’ compound during the April 19 climax, but careful (albeit belated) technical analysis of videotapes of the incident failed to establish reliable evidence of any such action. DANFORTH, *supra* note 166, at 5, 17-29; Lynch, *supra* note 175; John Dougherty, *Armed and Dangerous*, WORLD NET DAILY, June 6, 2001, available at http://www.cesnur.org/2001/waco_june01.htm#Anchor49575.

179. The FBI also attempted some sophisticated surveillance techniques in order to obtain more complete knowledge about activities inside the compound. They smuggled miniature eavesdropping equipment inside the building when they delivered milk and other goods (although the Davidians may have detected and destroyed some of these devices) and employed military-style “[f]orward-looking infrared systems” that can detect body heat even through walls and doors. LINEDECKER, *supra* note 166, at 214; DANFORTH, *supra* note 166, at 7, 38; Oliver, *supra* note 167, at 80; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 107-08.

180. DENNIS, *supra* note 167, at 24, 35; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 98; BAILEY & DARDEN, *supra* note 166, at 171; *Activities Part I*, *supra* note 167, at 471-74 (documents authorizing ATF use of diversionary devices in the Waco action); *Activities Part II*, *supra* note 166, at 369 (questioning the safety of flash-bangs); DANFORTH, *supra* note 166, at 143.

181. REAVIS, *supra* note 166, at 138-39; *Activities Part I*, *supra* note 167, at 462; TREASURY REPORT, *supra* note 167, at 96.

182. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 102; *Materials Relating*, *supra* note 167, at 460. At least two outsiders did manage to penetrate the security perimeter and join the Davidians early in the siege; officials worried that many others might have attempted similar entry. REAVIS, *supra* note 166, at 247-51; BAILEY & DARDEN, *supra* note 166, at 181-85; LINEDECKER, *supra* note 166, at 198-99; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 83-84, 150-54.

LETHAL AND NON-LETHAL WEAPONS

Bright lights, loud noises, and raucous music can likewise serve as primitive NLW. The FBI sought to wear down the Davidians' resistance by depriving them of sleep with glaring stadium lights at night and by exposing them to repeated playing of recordings of annoying sounds such as dental drills, seagull squawks, shrieks of rabbits being slaughtered, sirens, telephone busy signals, crying babies, trains in tunnels, and low-flying helicopters, as well as jarring music including Tibetan Buddhist chants, reveille, marches, Mitch Miller Christmas carols, selections from Alice Cooper, and Nancy Sinatra's 1960s pop ode, "These Boots Were Made for Walking."¹⁸³

A variety of critical factors impeded the FBI's application of conventional deadly force throughout the ordeal. There were children in the compound, as well as an unknown number of persons who might not have been fully willing participants in Koresh's vision. The adults occasionally held children up to the windows, reminding law enforce-

183. LINEDECKER, *supra* note 166, at 221; REAVIS, *supra* note 166, at 259-62; BAILEY & DARDEN, *supra* note 166, at 245. At one point, Koresh responded in kind to the FBI's recordings, by setting his own (even larger) stereo speakers in the compound's windows and broadcasting loud rock and roll music back at the agents, in an all-night battle of the NLW bands. *Frontline, Waco: The Inside Story*, *supra* note 169; FUTURE WAR, *supra* note 6, at 47.

Shining bright lights into the compound also served another purpose, beyond annoying the Davidians and wearing down their resistance: it impeded the cult members' sight lines, making it harder for them to target the law enforcement personnel. REAVIS, *supra* note 166, at 261-62.

The FBI also shut off the electricity to the compound at irregular intervals, stopping Mount Carmel's lights and heat; the Davidians had only a limited capacity to produce their own electricity via generators. DENNIS, *supra* note 167, at 14; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 67; *Activities Part II*, *supra* note 166, at 320. The FBI also controlled the telephone lines, allowing the Davidians only calls to and from the law enforcement negotiators. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 29-30. Except by turning off all the electricity, the FBI was not able to interdict the Davidians' access to television and radio. On one occasion, law enforcement officials worried that Koresh might have seen a provocative televised report that could have compromised their negotiating strategy. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 167. *But see* DANFORTH, *supra* note 166, at 38, 140 (equipment loaned to the law enforcement agencies from the Air Force and the Army Special Operations Command included "classified television jamming equipment," which contractors operated briefly during the standoff).

Other tools of "psyops" (psychological operations) were also considered, including blowing scents (cooking food) into the compound, moving the security perimeter erratically back and forth, and broadcasting different descriptions of Koresh and the negotiations into the compound, where other cult members would hear them. *Materials Relating*, *supra* note 167, at 535-37.

After the Waco incident, FBI Director Louis J. Freeh signed a memorandum barring most forms of broadcasting of tapes of chants or other types of noises in future hostage negotiations. He concluded that such tactics "have no legitimate basis." *Materials Relating*, *supra* 167, at 763.

ment officials of the danger of striking innocent victims.¹⁸⁴ Also, the Davidians were armed with powerful, long-range lethal weaponry, requiring a safety standoff zone that kept law enforcement personnel at a distance, enlarging the perimeter that had to be protected and patrolled and requiring that fire fighting and medical staff and equipment remain somewhat remote.¹⁸⁵

How should we evaluate the use of tear gas in this type of situation?¹⁸⁶ CS (actually an aerosol powder, rather than a true gas) is the leading lacrimator, causing temporary but acute and disabling irritation to the eyes, mouth, nose, and upper respiratory tract. It was invented by chemists B.B. Corson and R.W. Stoughton in 1928 and by the 1960s had established itself as the predominant riot control agent for use by police and the U.S. military (including extensive application in combat in Vietnam) and for personal protection by individuals. CS is less lethal and causes less long-term injury (particularly to the eye) than any of its predecessors, but its overall safety was still in question, particularly when employed against children or pregnant women and especially when used in confined spaces or for long durations, as contemplated at

184. DENNIS, *supra* note 167, at 22; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 90.

185. DENNIS, *supra* note 167, at 60; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 260-61; TREASURY REPORT, *supra* note 167, at 33, 44. One Davidian who left the compound warned law enforcement officials that Koresh planned a suicide bombing by having a member of the cult strap explosives around his waist, armed to detonate when they surrendered to the FBI. DENNIS, *supra* note 167, at 37; *Activities Part III*, *supra* note 171, at 357 (prepared statement of Attorney General Janet Reno).

Subsequent criticism challenged the delay in bringing firefighting equipment and personnel onto the scene when the fire broke out in Mount Carmel. The trucks were standing by, but at some distance; several minutes elapsed before they were called, and they were held at the FBI checkpoint for a further period of time before attempting to suppress the fire. James R. Lewis, *Fanning the Flames of Suspicion: The Case Against Mass Suicide at Waco*, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 115, 118-19; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 111-12, 302-04 (noting that in total, thirty-one minutes elapsed between the start of the fire and the beginning of efforts to fight the flames; safety concerns prohibited earlier action, and, even if firefighting had commenced immediately, the shoddy construction of the Mount Carmel buildings would have resulted in the total loss of the structure); *Materials Relating*, *supra* note 167, at 161-62; DANFORTH, *supra* note 166, at 14, 145, 170; Pressley, *supra* note 176; Michael Isikoff, *Waco Siege Ends in Dozens of Deaths as Cult Site Burns After FBI Assault; Reno Says, "I Made the Decision,"* WASH. POST, Apr. 20, 1993, at A1.

186. Attorney General Janet Reno later recalled, when assessing the FBI's proposed plan for inserting CS into Mount Carmel, "I said, isn't there something that you could distribute through an airplane and just fly over and put them to sleep for an hour while we go in and get them out and was told that there was no technology that could be provided." *Activities Part III*, *supra* note 171, at 362.

LETHAL AND NON-LETHAL WEAPONS

Waco.¹⁸⁷ The April 19 tear gassing came three months after the United States had signed the Chemical Weapons Convention; at that time, the treaty had not yet been ratified, so it was not legally in force for the United States. In any event, this sort of operation would have been a valid application of a “riot control agent” for a “purpose not prohibited” under the Convention, i.e., “law enforcement.”¹⁸⁸

Could a more effective, safer chemical have disabled the Davidians quickly enough to pre-empt their shooting at the FBI and enable an effective surprise assault? In particular, would a more deft delivery mechanism—i.e., something other than violently and repeatedly puncturing the walls of the main building—have quietly sedated or roused the members and not frightened them into believing Koresh’s assertions that Armageddon was nigh?¹⁸⁹ What if powerful malodorants had

187. *Materials Relating*, *supra* note 167, at 128-38; Robert Cancro, Letter to Deputy Attorney General Philip B. Heymann (Aug. 30, 1993), in RECOMMENDATIONS OF EXPERTS FOR IMPROVEMENTS IN FEDERAL LAW ENFORCEMENT AFTER WACO, *supra* note 178, at 4; DANFORTH, *supra* note 166, at 11-14; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 264-67; Jerry Seper, *FBI Used Chemical Banned for War: Cult’s Children Faced ‘Hell’*, WASH. TIMES, Apr. 22, 1993, at A1; Jerry Seper, *White House Defends Use of Tear Chemical; Calls CS an ‘Appropriate’ Weapon to End Standoff*, WASH. TIMES, Apr. 23, 1993, at A1; *Activities Part II*, *supra* note 166, at 384-401, 473-80 (assessing safety and effectiveness of CS).

188. CWC, *supra* note 93, art. II §§ 7, 9; *Activities Part II*, *supra* note 166, at 394, 428-29 (testimony of Hays Parks).

189. Despite Attorney General Janet Reno’s anticipation that the April 19 CS operation would be deft and non-aggressive (it was not supposed to be “D-Day” in her understanding), the activity must have felt like a full-fledged assault to the inhabitants of Mount Carmel. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 267; Cancro, *supra* note 187, at 5; *Materials Relating*, *supra* note 167, at 147-48; *Activities Part III*, *supra* note 171, at 117.

One of the most intense controversies in the Waco incident concerned the origin of the deadly fire. Some alleged that the CS operation was responsible for starting the fire; either the chemical agent itself or the propellant that accompanied it might have been flammable and might have ignited upon contact with the Davidians’ lanterns. Alternatively, the tanks that knocked down sections of wall while inserting the CS might have tipped over some Coleman lanterns that fell onto hay bales that the inhabitants were using as shields. However, the FBI asserted that the CS package was not flammable, that the fire began long after the tanks had withdrawn, that the fire started at three locations simultaneously, and that people inside the compound were (dimly) heard talking about starting a fire and seen making movements that could have accomplished that. Years later, it was revealed that the law enforcement officers did fire three rounds of “military” CS, which were known to be pyrotechnic, capable of starting a fire. However, reviewers concluded that none of these rounds did, in fact, start a fire (they were expended four hours before the deadly fire erupted, and none of them came close to the main building). While the matter can never be fully laid to rest, the evidence now strongly points toward the Davidians’ deliberately igniting the fires in a final suicidal outburst. DENNIS, *supra* note 167, at 29-34; REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 304-07, 329, app. D; LINEDECKER, *supra* note 166, at 246-48; R.W. Bradford, *Who Started the Fires? Mass Murder, American Style*, in FROM THE ASHES:

been inserted into the building; would the people (especially the children) have been peacefully driven outdoors? Is it imaginable that biological means might have been able to befoul (or ruin the taste of) the Davidians' food and water supplies, a stockpile that, the FBI feared, might have enabled the cult members to hold out through a year-long siege?¹⁹⁰

Alternatively, could non-chemical means have addressed the situation?¹⁹¹ If acoustic rays could have penetrated the walls of the buildings and incapacitated the residents, would the Davidians have surrendered meekly? Could deployment of non-lethal barrier materials—e.g., slippery or sticky foam—have guaranteed that particular locations, such as the compound's water tower and watch tower, were effectively off-limits for the Davidians, assuaging FBI concerns that such perches could have been occupied by snipers?¹⁹² When one of the .50 caliber guns was ominously propped into a window, could NLW have somehow neutralized it in a non-explosive fashion, thereby removing one of the worst threats, without Koresh even realizing that his deterrent had been compromised?¹⁹³ Could novel devices have rendered all the Mount Carmel windows opaque, so cult members could not effectively see—or shoot—out of them, thereby equalizing things with FBI agents who did not know what was going on indoors and who were instructed not to

MAKING SENSE OF WACO, *supra* note 166, at 111; Lewis, *supra* note 185, at 115; Lynch, *supra* note 175; *see also* Tommy Witherspoon, *Former Federal Prosecutor Bill Johnston Indicted by Special Grand Jury*, WACO TRIBUNE-HERALD, Nov. 9, 2000; *Materials Relating*, *supra* note 167, at 155-63; *Activities Part III*, *supra* note 171, at 121-98.

190. The status of the Davidians' water supply was an important uncertainty. The compound had an artesian well from which water was pumped into a 1500-gallon tank. During the February 28 shooting, the tank was punctured, and despite improvisational efforts to patch it, it was capable of holding only about 200 gallons. When law enforcement officials shut off the compound's electricity, the ability to pump additional water from the well was lost. Accordingly, Koresh ordered severe measures of water conservation (rationing people to only a few ounces per day), and during the few rainstorms in those dry weeks, the Davidians desperately attempted to capture rain water. The FBI, however, mistakenly thought the water tower was still full. The law enforcement officials contemplated tightening the stranglehold still further by puncturing the bottom of the water tower or breaking the exposed supply lines leading from it. Doing so, however, would have intensified the suffering of the children inside Mount Carmel. REAVIS, *supra* note 166, at 261, 265-66; *Activities Part I*, *supra* note 167, at 106 (prepared statement of Ray Jahn).

191. "The Attorney General considered all non-lethal options other than gas." REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 270.

192. *Id.* at 109, 257-58.

193. *Id.* at 141, 260-61; *Activities Part II*, *supra* note 166, at 330.

LETHAL AND NON-LETHAL WEAPONS

fire weapons into a room unless it was clear who was there?¹⁹⁴

Could snipers have used a long-range non-lethal weapon to incapacitate, but not kill, Koresh when he appeared at a window of the compound, providing a moment for a sudden assault?¹⁹⁵ Could modern electronic means have shut down the Davidians' access to radio and television—even if they had used their generators after the FBI turned off the compound's electricity—further isolating the cult and ensuring that potentially damaging news broadcasts did not reach them?¹⁹⁶ If an assault had still become necessary, would it have been possible for the FBI to employ non-lethal projectiles or perhaps electric stun guns, at least until they were confident that a particular room or wing of the building was not occupied by children or by other incoming law enforcement figures?¹⁹⁷

To ask these questions is not to answer them, either on the level of the tactics and tools that might be available today (or in the future) but were not in the inventory in 1993, or on the level of whether it would have been prudent to attempt them in this particular situation. But the questions provide grist for speculation about how the increasing panoply of NLW might enlarge the range of options that law enforcement officials could call upon in crises of this sort.

As discussed above, the operative legal standard for assessing a law enforcement use of physical coercive power is “reasonableness,” an elastic yardstick that requires case-by-case analysis, taking into account all the relevant circumstances. Notably, police are not required to use “the least possible” force or to escalate their application of power only when lesser measures have proven unavailing.

Some outside observers charged that the ATF, FBI, and other units applied excessive, unreasonable power; they wanted to characterize federal agents as “jackbooted thugs” invading a peaceful, if bizarre, settlement. But a true measure of the legality of the operation must take into account the validity of the warrants to be served, the reasonableness of the belief that the Davidians were engaged in illegal

194. Mark Fischetti, *Less-than-Lethal Weapons*, TECH. REV., Jan. 1995, at 14 (describing an NLW system using laser beams to scatter light through microabrasions on windows, automobile windshields, and aircraft canopies, rendering the entire sheet of glass an opaque green).

195. See Davis, *supra* note 178, at 22-23.

196. See DANFORTH, *supra* note 166, at 38, 140 (suggesting that such jamming equipment was available to the law enforcement authorities).

197. By some estimates, as many as half the casualties suffered by the ATF officers during the February 28 raid may have come from “friendly fire,” bullets shot by other law enforcement officers that accidentally hit their colleagues. Oliver, *supra* note 167, at 77.

operations, and, especially, their massive, heavy weaponry and the degree to which they had dug themselves into their fortification. The FBI demonstrated great patience throughout the lengthy siege, finally deciding to force a confrontation only out of frustration with the sputtering negotiations and dismay at the prospect of an indefinitely continued standoff.

Finally, it is noteworthy that U.S. courts reviewing a law enforcement use of weapons do not ordinarily second-guess the procurement decisions that created the available array of weapons at the authorities' disposal. That is, even if hindsight suggests that better chemicals or an improved array of other modern non-lethal weapons might have been effective, police are not liable for their failure to have purchased those devices. The legal judgment would inspect what the law enforcement officers on the scene in Waco might have done, not what additional array of possibilities could have served their purposes had such different systems and technologies been available to them.

* * *

In sum, the Waco confrontation was an unmitigated disaster from start to finish,¹⁹⁸ the least successful of this Article's three case studies. The ATF and the FBI failed utterly in their objectives: the main malfeasors were not arrested, the premises were not searched, and the contraband was not seized. Instead, eighty-four people died; only forty-four original inhabitants of the Mount Carmel complex survived. February 28, 1993, was recorded as the bloodiest day in the history of the ATF and perhaps the most costly day in all of American law enforcement;¹⁹⁹ April 19, 1993, inflicted lasting damage upon the reputation of—and the public support for—federal authorities.²⁰⁰

This is not the forum in which to second-guess the original ATF incursion, the FBI negotiation strategy during the fifty-one-day stand-off, or the timing and planning of the tear gas operation.²⁰¹ The

198. For stark criticisms of both ATF and FBI, at the operational and the senior levels, see *Materials Relating*, *supra* note 167, at 4-11.

199. See Kolman, *supra* note 168, at B31, B35; Lynch, *supra* note 175.

200. Timothy McVeigh had visited the Mount Carmel site after the inferno and chose the two-year anniversary of the conflict, April 19, 1995, as the inspirational date for his devastating bombing of the Alfred P. Murrah federal building in Oklahoma City. Jason Embry, *Davidians Don't Like Connection to McVeigh*, WACO TRIBUNE-HERALD, June 14, 2001.

201. DENNIS, *supra* note 167, at 39-47 (assessing FBI negotiating strategy during the 51 days); U.S. DEP'T OF JUSTICE, *supra* note 178, *passim*; Boyer, *supra* note 174, at 44-45; *Frontline*, *Waco: The Inside Story*, *supra* note 169; Charlie Beckwith, *What Went Wrong in Waco? Poor Planning, Bad Tactics*

LETHAL AND NON-LETHAL WEAPONS

concern here is with the lethal and non-lethal weapons employed, not with whether arms could have been avoided altogether by snatching Koresh when he was away from the compound²⁰² or by adopting a less-confrontational style.²⁰³ And one must remember that the primary blame for the gunplay, the inferno, and all those unnecessary deaths lies with David Koresh, the “sinful messiah.” He led his devoted flock to accumulate and eventually to fire the vast illegal arsenal, and finally to torch their home, consigning themselves and their children to horrifying deaths.

The intransigence of the Davidians—as well as their foresight in preparing for a lengthy standoff—created a most difficult and uncertain situation for law enforcement. All paths were risky, and, even with 20/20 hindsight, it is difficult to discern any approach that would have guaranteed success.²⁰⁴ Federal authorities earnestly attempted to save lives—Attorney General Janet Reno’s personal commitment to protecting children was well-known—and FBI agents demonstrated incredible discipline and good judgment by not firing into the compound during the fifty-one days or during the April 19 denouement.

The law enforcement agencies benefited from some basic non-lethal weapons—e.g., flash-bang grenades, obnoxious sound and light projections, and simple barrier systems—but their available inventory was woefully inadequate. Reno later reflected the obvious conclusion, saying that if she had known how the Davidians would respond to the tear gas injections, she would not have proceeded.²⁰⁵ However, she had few good alternatives. Tear gas was just about the only available tool that offered much hope of peaceably flushing the cult members out of

Result in Botched Raid, in FROM THE ASHES: MAKING SENSE OF WACO, *supra* note 166, at 67 (criticizing the operation of the February 28 ATF action).

202. Officials asserted that Koresh rarely left the Mount Carmel compound before the February 28 ambush, but critics noted several occasions when he had gone jogging or into town alone or with only a few other people and opined that he could have been lured off the compound, even at a late date, with the right approach. See LINEDECKER, *supra* note 166, at 177-78; BAILEY & DARDEN, *supra* note 166, at 161; REAVIS, *supra* note 166, at 180-81; *Materials Relating*, *supra* note 167, at 27-28.

203. Prior to the ATF activities, the local sheriff had some relatively reasonable dealings with Koresh and had established a relationship of some trust; local child welfare authorities had also visited Mount Carmel twice, without much satisfaction, but at least without gunplay. *Frontline, Waco: The Inside Story*, *supra* note 169; Niebuhr & Thomas, *supra* note 167; REAVIS, *supra* note 166, at 68; *Materials Relating*, *supra* note 167, at 742 (statement of Texas Child Protective Services worker Joyce Sparks).

204. See Davis, *supra* note 178, at 2; *Danforth Privately Praised Reno on Waco*, NEWSMAX, June 13, 2001, available at http://www.cesnur.org/2001/waco_june01.htm#Anchor-49575.

205. LINEDECKER, *supra* note 166, at 248-49.

their encampment.²⁰⁶

In the aftermath of Waco, Reno undertook to expand the array of options for future incidents. She wrote a watershed request memorandum to the Secretary of Defense and secured an agreement to expand interdepartmental collaboration in the pursuit of advanced NLW.²⁰⁷ The Department of Justice had already initiated a small research program in pursuit of non-lethals,²⁰⁸ but by teaming with the Pentagon and the Central Intelligence Agency, much greater progress could have been achieved. Merging the frequent experience that local and federal law enforcement had garnered with simple NLW with the greater technology and resources of the national security community might have offered substantial synergistic benefits to both sets of partners.

One other reflection on Waco: it provided a sampling of both the best and the worst environments for bringing NLW to bear. On the one hand, the ATF had been ambushed, losing four agents to a barrage of deadly fire, and they concluded that part of the reason for the fiasco was being “outgunned” by superior firepower. That is surely a most inhospitable setting for application of non-lethal technology; a natural human instinct is to exert maximum force, to be your toughest, when already bloodied in battle.²⁰⁹ On the other hand, the extended duration at Waco eased some of the logistical difficulties traditionally associated with NLW. The fifty-one-day delay provided ample opportunity to marshal, prepare, plan, and practice with the optimal munitions. The Mount Carmel site was a sitting duck, serviced by adequate roads, electric grid, and other supporting infrastructure. Law enforcement officials did not have to choose between traditional lethal or novel non-lethal arms; both sets of equipment could have been assembled at leisure. While in some circumstances police or military units may face a stark choice about what alternative pieces of equipment to carry with them into sudden battle and what tactics to employ in

206. DENNIS, *supra* note 167, at 63 (concluding that “(e)ven if the FBI had been more keenly aware of [Koresh’s] intentions, it was limited to gassing the compound as the only non-lethal means of resolving the crisis”).

207. PHILIP B. HEYMANN, LESSONS OF WACO: PROPOSED CHANGES IN FEDERAL LAW ENFORCEMENT A16-18 (1993).

208. *Activities Part II*, *supra* note 166, at 586, 604 (statement of Larry A. Potts); Boyd, *supra* note 9, § 5.1 (as early as 1967, the Department of Justice had undertaken to explore the feasibility of NLW, but even in 1992, the program was described as “nascent”).

209. REPORT TO THE DEPUTY A.G. ON WACO, *supra* note 166, at 110. The FBI’s task in Waco was made more difficult by the fact that the bureau entered the operation “backwards,” after an earlier assault by another law enforcement agency had already failed disastrously, and emotions were running high on all sides.

LETHAL AND NON-LETHAL WEAPONS

split-second decision-making, it is worth noting that not all weapons applications play out at that rapid pace.

V. THE RUSSIANS AND THE CHECHENS IN MOSCOW IN 2002

The second of our three confrontations flashed without warning across the global consciousness in October 2002, as Russian officials suddenly confronted a most urgent hostage/barricade crisis in their nation's capital. Again, this Article first presents the relevant background on the event, then describes its dramatic (and still not fully understood) climax, before finally speculating on the alternatives that better NLW might have provided.

A. *Background on the Moscow Confrontation*

Chechnya is a small (17,000 square kilometers), long-turbulent region in southern Russia, with a population of approximately 1 million. It declared its independence in 1991, but, unlike other restive Caucasian breakaways, Chechnya was not recognized by other states, and, after a period of some disinterest and passivity, Russia forcefully resisted its secession.²¹⁰ Boris Yeltsin sent troops to Chechnya in 1994 to attempt to quell the separatist movement, but this campaign—despite a crushing Red Army presence in the Chechen capital of Grozny—resulted in a humiliating defeat for the Kremlin. When the demoralized Russian troops withdrew in 1996, the Chechens formulated a government and elected their own president. Under a peace plan negotiated with Moscow, a decision on Chechnya's final legal status was to be deferred for five years.²¹¹

Soon, however, any semblance of law and order collapsed, and the

210. Georgia, Armenia, and Azerbaijan were among the former republics of the U.S.S.R. that became independent in the early 1990s. In contrast, Chechnya, Ingushetia, Dagestan, and a number of other mainly Muslim provinces in the North Caucasus are categorized as "autonomous republics" within the Russian federation. The population of Chechnya has been variously estimated as being as high as 1.2 million (before the 1994-1996 fighting) and as low as 500,000 (today). CENTRAL INTELLIGENCE AGENCY, WORLD FACTBOOK 452-56 (2004); Yavus Akhmadov et al., *Islam in the North Caucasus: A People Divided*, at <http://www.jmu.edu/orgs/wrni/islam5.htm>; *Chechnya Photo Journal—Introduction to Site Visit*, U.S. Comm. for Refugees, at <http://www.refugees.org/news/sitevisit/chechnya/> (last visited Aug. 18, 2004).

211. See generally DMITRI V. TRENIN ET AL., *RUSSIA'S RESTLESS FRONTIER: THE CHECHNYA FACTOR IN POST-SOVIET RUSSIA* (2004); CARLOTTA GALL & THOMAS DE WAAL, *CHECHNYA: CALAMITY IN THE CAUCASUS* (1998); Q&A: *The Chechen Conflict*, BBC NEWS, Oct. 29, 2002; Elliot Stanton Berke, *The Chechnya Inquiry: Constitutional Commitment or Abandonment?*, 10 EMORY INT'L L. REV. 879 (1996); Thomas D. Grant, *Current Development: Afghanistan Recognizes Chechnya*, 15 AM. U. INT'L L. REV. 869

country descended into a morass of religious extremism, terrorism, banditry, kidnapping, and corruption. A series of terrorist attacks on apartment buildings and other civilian locations in Moscow and other Russian cities was linked to Chechnya, and, in 1999, Vladimir Putin led a second offensive against the chaotic breakaway region. This time Moscow succeeded in reasserting a shaky partial control, albeit at a price of 80,000 Russian troops being deployed in the country in support of a Kremlin-installed government. Widespread terrorist outrages continued—even after Putin grandly declared an end to the military phase of the operation—with frequent large-scale deadly incidents both in Chechnya and in Russia. After September 11, 2001, and when links appeared between the Chechen rebels and the al-Qaeda terrorist network, international pressure for restraint on Russia waned, and Putin further strengthened his resolve to resist sovereignty for the breakaway province.²¹²

On October 23, 2002, some 800 people (mostly Russians, but including perhaps seventy-five foreigners) were enjoying an evening performance of the popular romantic musical “Nord-Ost” at the Dubrovka Theater Center in southeast Moscow, only about three miles from the

(2000); Brian Glyn Williams, *The Russo-Chechen War: A Threat to Stability in the Middle East and Eurasia?*, 8 MIDDLE E. POL’Y 128, 136 (2001).

212. TRENIN ET AL., *supra* note 211, at 35-48, 112-14 (noting that a variety of Russian military and paramilitary forces were engaged in Chechnya, including forces from the Ministry of Defense, the Ministry of the Interior, the border guards, the railway troops, and the security services (the successor to the KGB, now known as FSB); lead responsibility for activities in Chechnya was formally transferred from the Ministry of Defense to the FSB in 2001, and from FSB to the Ministry of the Interior in mid-2003); Q&A: *The Chechen Conflict*, *supra* note 211 (recounting history of Chechen separatism, concluding that a link with al-Qaeda “seems quite likely”); *Chechen Rebels’ Hostage History*, BBC NEWS, Oct. 24, 2002 (describing three major hostage-taking crises in Chechnya and Russia in the 1990s), at <http://news.co.uk/1/hi/world/europe/2357109.stm>; OLGA OLIKER, RUSSIA’S CHECHEN WARS 1994-2000: LESSONS FROM URBAN COMBAT 36-49 (2001) (describing events leading to, and during, the second Chechen war); Christian Caryl, *Death in Moscow: The Aftermath*, N.Y. REV. BOOKS, Dec. 19, 2002, at 58; Sharon Liebetreu, *The Moscow Dubrovka Theater Center Hostage Crisis: Chemical Incapacitants and International Law* (2003) (unpublished seminar paper, Georgetown University Law Center) (on file with the Georgetown Journal of International Law); Peter Baker, *For Putin, a Little War that Won’t End*, WASH. POST, Oct. 26, 2002, at A23 (at time of theater hostage crisis, 80,000 Russian troops were stationed in Chechnya; at least 4,000 Russian soldiers and 80,000 Chechens had been killed in the fighting); David Chazan, *Chechen Rebel Divisions*, BBC NEWS, Oct. 26, 2002, at <http://news.bbc.co.uk/1/hi/world/europe/2364271.stm>; Sharon LaFraniere, *How Jihad Made Its Way to Chechnya; Secular Separatist Movement Transformed by Militant Vanguard*, WASH. POST, Apr. 26, 2003, at A1.

LETHAL AND NON-LETHAL WEAPONS

Kremlin walls.²¹³ At about 9:00 p.m., early in the second act of the show, fifty masked, camouflaged, and heavily armed men and women, led by Movsar Barayev, one of the most fanatic Chechen terrorists known at the time, entered the theater, seized control, and locked down the three-story facility.²¹⁴ The terrorists confined their hostages—a group including the audience, cast, and crew—to the theater seats, emplaced 250 pounds of explosives amidst them, and threatened to kill everyone unless Russia ended its military campaign in Chechnya, withdrew its forces, and granted independence.²¹⁵

Over the next couple of days, the terrorists released several hostages, but there was sporadic gunfire, too, and negotiations with the Russian Government and a variety of other interlocutors eventually stalled. Moscow authorities reluctantly concluded that a peaceful resolution was not forthcoming; the terrorists seemed fully content—and perhaps determined—to play the role of martyrs. Many of the Chechens guarding the hostages kept grenades and plastic explosives strapped to their bodies, for quick, suicidal detonation in the event of a rescue attempt. Around 3:30 a.m. on October 26, shots rang out from the theater; one hostage was killed and a couple more were wounded. No one outside could determine whether the threatened wholesale slaughter of the innocents had begun.²¹⁶

213. Most early reporting referred to the theater by its original name, the House of Culture for the State Ball-Bearing Factory. See, e.g., Susan B. Glasser, *Rescue Ended Days of Horror and Uncertainty*, WASH. POST, Oct. 27, 2002, at A1.

214. Chazan, *supra* note 212 (identifying the group that seized the Moscow theater as “the most extreme faction” of the splintered Chechen separatist movement). Movsar Barayev was a nephew of Chechen warlord Arbi Barayev, one of the most notorious hostage-takers, himself killed in the Chechen fighting in 2001. *Q&A: The Chechen Conflict*, *supra* note 211.

215. *The Moscow Theatre Siege—Transcript*, BBC NEWS, Jan. 15, 2004, at <http://www.bbc.co.uk/science/horizon/2004/moscowtheatretrans.shtml>; Caryl, *supra* note 212; *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare* (Center for Nonproliferation Studies, Monterey Inst. of Int’l Stud., Monterey, CA), Nov. 4, 2002, available at <http://cns.miis.edu/pubs/week/02110b.htm>.

216. *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare*, *supra* note 215; Susan B. Glasser & Peter Baker, *Russia Seizes Theater from Militants in Bloody Battle*, WASH. POST, Oct. 26, 2002, at A1.

The Chechens had announced various deadlines for the beginnings of the executions, including one for the early hours of October 26. However, the gunfire heard that morning was not actually the commencement of organized killings; instead, it was a response to one of the hostages who, apparently at the end of his patience, suddenly shouted something and started to run. The terrorists shot and killed him, also wounding two others. No one outside the theater, however, could determine the scope and meaning of those shots. *How Special Forces Ended Siege*, BBC NEWS, Oct. 29, 2002, at <http://news.bbc.co.uk/1/hi/world/europe/2363601.stm>; Glasser & Baker,

B. *The Assault: October 26, 2002*

Around 5:15 a.m. on Saturday, October 26, Russian special forces executed their hastily drawn plan, pumping a still-unknown quantity of a still-undisclosed chemical narcotic gas through the Dubrovka Theater's ventilation system. Everyone inside—terrorists and hostages alike—grew groggy and listless, quickly falling into unconsciousness. A few of the terrorists, apparently, recognized what was happening, but they did not have the time, or the mental and physical dexterity, to detonate the explosives. Some fifteen to thirty minutes of exposure to the chemicals rendered everyone inside the theater immobile—though some of the terrorists positioned in hallways adjacent to the auditorium remained unaffected.²¹⁷

By 6:00 a.m., 200 of the Russian elite *spetsnaz* forces launched their assault, barging into the theater from multiple directions by breaking down a wall, plunging through the ceiling, and bursting up from the basement. There was a short but intense firefight with some of the terrorists who had lingered in the foyer and on the second-floor landing behind the balcony and who were thus unaffected by the gas. Grenades and small arms quickly suppressed this resistance, and the commandoes raced to locate the unconscious terrorists inside the theater. The *spetsnaz* immediately shot and killed them all.²¹⁸

The troops next began defusing the explosives, escorting or pulling

supra; Steven Lee Myers et al., *The Aftermath in Moscow: The Chronology; From Anxiety, Fear and Hope, the Deadly Rescue in Moscow*, N.Y. TIMES, Nov. 1, 2002, at A1.

217. Myers et al., *supra* note 216; *The Moscow Theatre Siege—Transcript*, *supra* note 215; *How Special Forces Ended Siege*, *supra* note 216. Some of the hostages and some of the terrorists apparently realized that gas was pouring into the theater through the ventilation system, but for whatever reason the terrorists did not use those few moments to detonate the explosives. The male Chechens immediately ran out of the theater auditorium to prepare to meet the incoming Russian assault; the female terrorists may have been waiting for orders to trigger the explosives, orders they did not receive before losing consciousness. Mark Wheelis, *The Danger of "Nonlethal" Weapons*, ARMS CONTROL TODAY, July/Aug. 2004, at 8; Michael Wines, *Hostage Drama in Moscow: The Aftermath; Hostage Toll in Russia Over 100; Nearly All Deaths Linked to Gas*, N.Y. TIMES, Oct. 28, 2002, at A1; see also Susan B. Glasser & Peter Baker, *Gas in Raid Killed 115 Hostages; Only 2 Slain by Rebels; More Than 600 Remain Hospitalized in Moscow*, WASH. POST, Oct. 28, 2002, at A1.

218. Myers et al., *supra* note 216; *How Special Forces Ended Siege*, *supra* note 216; Wines, *supra* note 217. When the assault began, the male terrorists immediately left the theater chamber and prepared to engage in a gun battle against the assaulting Russians; the female terrorists remained inside the chamber with the hostages. In the end, the males were killed in the shootout with the *spetsnaz* in the hallways; the females were then summarily executed while they lay comatose in the theater. Wheelis, *supra* note 217, at 8; Peter Baker, *50 Militants, 90 Hostages Dead After Moscow Siege; Gas Used to Subdue Chechens; Fate of Americans Unknown*, WASH. POST, Oct. 27, 2002, at A1. One officer explained the point-blank killing of the unconscious terrorists, "We were finishing off

LETHAL AND NON-LETHAL WEAPONS

hostages out of the building, and engaging medical personnel at the scene and across the city. Some 450 emergency teams were already on standby. Ambulances and ordinary city buses were lined up to transport those in need of medical care. However, the Russian authorities had not advised the medics to be prepared for chemical casualties, and, in the chaos of the moment, emergency triage procedures sputtered. Doctors did not have enough of the key antidote, naloxone; they did not know how much to administer; and, inexplicably, they were not even told the exact nature of the sedative they were struggling to counteract. This failure to disclose precisely what drug the assaulting troops employed certainly impeded the effective treatment of the patients and subsequent evaluation of the exercise.²¹⁹

In the end, the death toll for the assault included all fifty terrorists (killed by firearms) and 129 hostages (all but one or two killed by the narcotic gas). None of the assaulting *spetsnaz* troops was hurt in the fighting, but nine were injured by the effects of the chemical. Almost all of the surviving hostages were hospitalized after the rescue; many required extended treatment because of the gas and may have incurred permanent disabilities.²²⁰ Supporters of the Russian Government's strategy claim, with good basis, that in the absence of forceful action, the terrorists probably would have murdered all 800 hostages, and perhaps quite soon.²²¹ Critics argue that the use of the still-mysterious

those who had explosives on them because people could come to or, on the contrary, convulsions could start." Wines, *supra* note 217.

219. *The Moscow Theatre Siege—Transcript*, *supra* note 215; Myers et al., *supra* note 216; Glasser, *supra* note 213; Wines, *supra* note 217; Paul Wax et al., *Unexpected 'Gas' Casualties in Moscow: A Medical Toxicology Perspective*, 41 ANNALS EMERGENCY MED. 700 (2003); Kathleen Knox, *Russia: More Than Two Days Later, Gas Still a Mystery*, RADIO FREE EUROPE—RADIO LIBERTY, Oct. 28, 2002, at <http://www.rferl.org/features/2002/10/28102002161259.asp>; Mike Hanna & Elise Labotte, *Anger Grows over Gas Tactics*, CNN, Oct. 28, 2002, at <http://archives.cnn.com/2002/WORLD/europe/10/28/moscow.gas/index.html>. *But see* Michael Wines, *Russia Names Drug in Raid, Defending Use*, N.Y. TIMES, Oct. 31, 2002, at A1 (Russian Health Minister Yuri L. Shevchenko asserted that city health officials had been adequately prepared for dealing with chemical casualties and that 1000 doses of the appropriate antidote were available).

220. Caryl, *supra* note 212; *How Special Forces Ended Siege*, *supra* note 216; *Russia: Officials Raise Hostage Death Toll*, GLOBAL SECURITY NEWSWIRE, Nov. 8, 2002, available at http://www.nyit.org/d_newswire/issues/2002/11/8/7p.html; Wheelis, *supra* note 217, at 8.

221. *Moscow Hostage Crisis: Criticism Mounts with Death Toll*, CENTER FOR DEFENSE INFO. RUSS. WKLY., Oct. 30, 2002, at 10, available at <http://www.cdi.org/russia/229-10-pr.cfm>; Baker, *supra* note 218.

Uncertainty persists about the exact numbers of people involved in this incident. During the chaos preceding and following the assault, some of the hostages may have wandered off without being identified and accounted for; some terrorists, too, may have slipped away. There is no

knockout gas may have been pre-mature; that the chemical was too powerful, killing 15% of the people it was intended to save; and that Moscow's possession and use of the substance in this situation may have violated its obligations under international law.²²²

C. *What Might Have Been*

The obvious "what if" question in this incident is to speculate about any possible alternative riot control or calmativive chemicals that might have sufficiently disarmed the terrorists without killing so many of their hostages. More generally, could other tactics and tools of assault, including advanced NLW, have accomplished the mission with the requisite speed and power to re-take the Dubrovka Theater safely without the use of chemical agents at all?

Russian authorities belatedly announced that the chemical pumped into the theater was based on fentanyl, but they provided no further specifics.²²³ Outsiders have speculated that the sedative may have been the derivatives carfentanil, sufentanil, or remifentanil, or perhaps a chemical cocktail combining several such ingredients. Fentanyl is a well-known, potent, man-made opiate, utilized with frequency as a quick-acting, short-duration anesthetic in the operating room. It is typically administered precisely, and only in concert with other drugs, because it can dangerously suppress respiration. Sufentanil is ten times stronger than fentanyl; carfentanil is ten times more powerful still. Carfentanil is not approved for human use, but is administered by veterinarians to tranquilize large mammals such as bison.²²⁴

precise count, therefore, of the number and identities of those confined inside the theater during the crisis. *The Moscow Theatre Siege—Transcript*, *supra* note 215; Caryl, *supra* note 212; Nick Paton Walsh, *Families Claim Death Toll from Gas in Moscow Siege Kept Secret*, *GUARDIAN* (London), Oct. 18, 2003; *Russia: Officials Raise Hostage Death Toll*, *supra* note 220.

222. *The Moscow Theatre Siege—Transcript*, *supra* note 215; *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare*, *supra* note 215; Steven Lee Myers, *Hostage Drama in Moscow: The Toxic Agent; Official Silence on Gas Raises Vexing Questions*, *N.Y. TIMES*, Oct. 28, 2002, at A10; *see also* Glasser & Baker, *supra* note 216.

223. *See* Wines, *supra* note 217; *Russia Comes Clean over Gas, Demands Extradition of Chechen Envoy*, *RUSSIA WEEKLY* (Center for Defense Information, Wash., D.C.), Oct. 30, 2002, available at <http://www.cdi.org/russia/229-1.cfm>; Wax et al., *supra* note 219, at 701 (noting that the Russian spokesman asserted that fentanyl "cannot by itself be called lethal"); Maria Granovsky, *The Use of Incapacitating Chemicals to End the Moscow Theatre Hostage Standoff: When the Right Action Is Illegal* 7 (2003) (unpublished paper, on file with the Georgetown Journal of International Law).

224. *The Moscow Theatre Siege—Transcript*, *supra* note 215 (describing sufentanil as fentanyl with sulphur added; carfentanil is fentanyl augmented by carbon; the greater power of these derivatives means that a smaller quantity would have to be administered to have the desired effect;

LETHAL AND NON-LETHAL WEAPONS

Fentanyl, sufentanil, and carfentanil are not chemical weapons like mustard gas or nerve agent. They are not listed on the schedules of the most tightly controlled toxic substances in the Chemical Weapons Convention. They might fit the treaty's criteria for riot control agents, in that they are characterized by rapid onset and short duration of incapacitating effects. Apparently, however, Russia has never registered any of these chemicals with the CWC's implementing organization under the treaty.²²⁵

The leading measure of a drug's safety and effectiveness in these types of applications is its "relative safety index" (or "therapeutic index"), the ratio of its "lethal dose" (or "LD50," the dose that would prove fatal for 50% of the people who receive it) to its "effective dose" (the "ED50," the rate that would have the desired therapeutic or sedating effect on half the treated individuals). In general, the greater the index, the safer the drug. For fentanyl, the relative safety index is approximately 277, meaning that a deadly dose is 277 times greater than the amount that should accomplish the intended sedating effect. For carfentanil, a much safer pharmaceutical in this sense, the index is approximately 10,000.²²⁶

Those statistics, however, are valid only for rigidly controlled applica-

ordinary fentanyl could not have been pumped through the theater's ventilation system with the necessary speed); *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare*, *supra* note 215; Wax et al., *supra* note 219, at 702 (noting that the chemical administered in the theater was not a gas, but an aerosol of fine particles, which behaves differently from a true gas); Bob Van Damme, *Moscow Theatre Siege: A Deadly Gamble that Nearly Paid Off*, 269 PHARM. J. 723 (2002); *Theater Gas Was Probably Powerful Narcotic, Experts Say*, GLOBAL SECURITY NEWSWIRE, Nov. 11, 2002 (suggesting that sedative was probably combined with halothane, another traditional anesthetic; the combination may have been deadlier than either drug alone and would have complicated the efforts of emergency crews administering antidotes), at http://www.nti.org/d_newswire/issues/2002/11/11/8p.html; David Brown & Peter Baker, *Moscow Gas Likely a Potent Narcotic; Drug Normally Used to Subdue Big Game*, WASH. POST, Nov. 9, 2002, at A12 (carfentanil is 8,000 times as powerful as morphine); Caryl, *supra* note 212; Liebetreu, *supra* note 212.

225. See CWC, *supra* note 93; David Ruppe, *CWC: Experts Differ on Whether Russian Hostage Rescue Violated Treaty*, GLOBAL SECURITY NEWSWIRE, Oct. 30, 2002 [hereinafter Ruppe, *CWC: Experts Differ on Whether Russian Hostage Rescue Violated Treaty*] (fentanyl was not declared by any country as a riot control agent under the requirements of the Chemical Weapons Convention), at http://www.nti.org/d_newswire/issues/newswires/2002_10_30.html#11; "Law Enforcement" and the CWC, CBW CONVENTIONS BULL., Dec. 2002, at 1-2; *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare*, *supra* note 215. But note that the CWC reporting requirement on its face applies to chemicals used for riot control purposes, not to those intended for other types of law enforcement applications. CWC, *supra* note 93, art. III §1(e).

226. *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare*, *supra* note 215; Wax et al., *supra* note 219, at 702 (providing slightly different index values); Brown & Baker, *supra* note 224. Notably, if the objective is to incapacitate everyone, instead of merely 50% of the population

tions, such as a hospital operating room, where the status (age, health, body mass, etc.) of the patient is well-known and the amount of the drug that is administered can be carefully modulated. In the Dubrovka Theater, however, exactly the opposite conditions prevailed. The hostages who inhaled the chemical were of vastly differing and unknown health profiles, and all were surely in decline due to stress, enforced inactivity, and the absence of adequate food and water for fifty-six hours. They were located at quite different places throughout the theater, some closer to or further from the building's air conditioning vents, with the result that they inhaled radically different amounts of the narcotic. They were unattended immediately after the exposure to the drug, so when they became unconscious, some slumped into awkward positions that constricted their airways, further reducing respiration. And after exposure, they were not afforded prompt treatment, and whatever treatment they did receive was compromised by the Russian Government's refusal to specify what chemical had been utilized.²²⁷

The sorry excuse proffered by the Moscow authorities—that many of the fatalities among the hostages were due to heart attacks, prior poor health, stress, and other complications—may contain a grain of truth, but the chemical and the Soviet-style secrecy that surrounds it obscure valid conclusions.²²⁸

Could a better chemical have been employed? There is, despite persistent research in Russia, the United States, and elsewhere, no magic chemical bullet. No calumet gas can rapidly and surreptitiously sedate or incapacitate a group of people distributed throughout a building without killing some of them. No matter how great the hypothetical safety index, the danger of unintended casualties in these idiosyncratic, uncontrollable circumstances will always remain.²²⁹

(e.g., all the terrorists in a hostage situation), then much higher levels of the medication must be provided, with a correspondingly greater danger of over-medication. Liebetreu, *supra* note 212.

227. *The Moscow Theatre Siege—Transcript*, *supra* note 215; Wax et al., *supra* note 219; Van Damme, *supra* note 224; see also Glasser & Baker, *supra* note 216.

228. *The Moscow Theatre Siege—Transcript*, *supra* note 215; Caryl, *supra* note 212; Peter Baker & Susan B. Glasser, *U.S. Ambassador Critical of Russia in Hostage Crisis; Gas Secrecy May Have Cost Lives, He Says*, WASH. POST, Oct. 30, 2002, at A14 (quoting Alexander Vershbow, the American ambassador to Russia, as alleging that more hostages' lives could have been saved if the Moscow authorities had been more forthcoming and more prompt in disclosing the exact sedative used in the theater).

229. *The Moscow Theatre Siege—Transcript*, *supra* note 215; *The Moscow Theater Hostage Crisis: Incapacitants and Chemical Warfare*, *supra* note 215; Myers et al., *supra* note 216; John Bowman, *Russian Knock-Out Gas*, CBC NEWS ONLINE, Oct. 28, 2002, at <http://www.cbc.ca/news/features/>

LETHAL AND NON-LETHAL WEAPONS

Opaque legal questions, too, surround the application of chemicals in this context. Was this truly a use of chemicals for treaty-permitted “law enforcement” against terrorists, or was it more akin to a prohibited “method of warfare” against armed rebels? The CWC does not define the borderline between those two forms of violence, and the corpus of international law likewise has trouble separating those sometimes-conjoined twins. The scale and frequency of the fighting surrounding Chechen separatism may seem sufficient to classify the struggle as an “armed conflict,” at least for some purposes of international law. The disparate locations of the plague of guerrilla violence—not confined to Grozny or Chechnya alone, but spreading to Moscow and other Russian cities—likewise seem to implicate a characterization of the conflict approaching civil war.²³⁰

If this confrontation is judged by the standards of armed conflict, then the Chemical Weapons Convention would prohibit the application of any toxic chemicals (lethal or non-lethal) as a method of warfare. Even if Moscow officials believed in good faith that the fentanyl saved lives, and even if they were correct in that judgment, the world has turned its back on chemical combat, and some other mechanism would have to have been found. In addition, the customary

knockoutgas.html; Guy Gugliotta, *U.S. Finds Hurdles in Search for Nonlethal Gas*, WASH. POST, Nov. 1, 2002, at A30; David Ruppe, *United States: U.S. Military Studying Nonlethal Chemicals*, GLOBAL SECURITY NEWSWIRE, Nov. 4, 2002 [hereinafter David Ruppe, *United States: U.S. Military Studying Nonlethal Chemicals*], at http://www.nti.org/d_newswire/issues/newswires/2002_11_4.html#7; see also *The Search for a Knockout Weapon*, N.Y. TIMES, Oct. 30, 2002, at A26; Judith Miller & William J. Broad, *Hostage Drama in Moscow: The Toxic Agent; U.S. Suspects Opiate in Gas in Russia Raid*, N.Y. TIMES, Oct. 29, 2002, at A1.

230. See Cherylyn Brandt Ahrens, Note, *Chechnya and the Right of Self-Determination*, 42 COLUM. J. TRANSNAT'L L. 575 (2004); “Law Enforcement” and the CWC, *supra* note 225, at 1; Ruppe, *CWC: Experts Differ on Whether Russian Hostage Rescue Violated Treaty*, *supra* note 225; Ruppe, *United States: U.S. Military Studying Nonlethal Chemicals*, *supra* note 229; Knox, *supra* note 219

Under the 1977 Protocol II Additional to the 1949 Geneva Conventions, the rules for “non-international armed conflicts” apply to fighting involving “dissident armed forces or other organized armed groups which, under responsible command, exercise such control over a part of its territory as to enable them to carry out sustained and concerted military operations” but not to “situations of internal disturbances and tensions, such as riots, isolated and sporadic acts of violence and other acts of a similar nature.” Protocol II to the Geneva Conventions, *supra* note 132, art. 1.1, 1.2; see also Paola Gaeta, *The Armed Conflict in Chechnya Before the Russian Constitutional Court*, 7 EUR. J. INT'L LAW 563, 568 (1996) (noting that Russian Constitutional Court has determined that the conflict in Chechnya is a civil war under Protocol II, as a prolonged internal conflict having great intensity). Of course, a “law enforcement” operation could occur even in the midst of an “internal armed conflict,” so even if there were greater clarity about the legal characterization of the overall Chechen conflict, that would not by itself resolve the question of Russia’s compliance with the CWC in the Moscow theater incident.

international law of armed combat would bring to bear the requirements for avoiding “unnecessary suffering,” for “discriminating” between combatants and civilians, and for refraining from attacking fighters who had already been wounded or otherwise rendered unable to resist.

Alternatively, if this were judged to be a law enforcement operation, instead of combat, the legality under the CWC is still dubious. One might like to look more closely at the Russian chemical inventory itself: what, exactly, was this substance or combination of pharmaceuticals? Could it have been, as some have speculated, an entirely new member of the remarkable fentanyl family, a variety unknown in the West?²³¹ What quantities of the drug have been produced and has Russia ever considered reporting it under CWC Article III.1 (e)?²³² Has it ever been used elsewhere? (There have been occasional murky reports of other applications of unknown chemicals in domestic riot control operations in the former Soviet Union.)²³³ How quickly do the disabling physical symptoms of the drug disappear? (Many hostages required extensive hospitalization and may suffer years of lingering effects.) And how would it fit inside the CWC’s definition of legitimate riot control agents as those that lose their effect “within a short time following termination of exposure”?²³⁴

Moreover, one would like to know more about the administrative side: which entity or entities within the Russian bureaucracy are responsible for this drug? Was it created for, held by, and applied by “military” forces (making it look more like a tool of war) or “police” forces (making it appear more akin to counter-terrorism and domestic law enforcement)? The *spetsnaz* “Alpha Team” that conducted the assault on the theater is a commando unit of the Federal Security Service (FSB, the successor to the KGB); there were also plenty of local police and other law enforcement teams engaged in the operation, a combination

231. *The Moscow Theatre Siege—Transcript*, *supra* note 215.

232. Global Security Newswire, *Russia: U.S. Believes Russian Gas Was an Opiate* (Oct. 29, 2002), at http://www.nti.org/d_newswire/issues/newswires/2002_10_29.html#9; Ruppe, *CWC: Experts Differ on Whether Russian Hostage Rescue Violated Treaty*, *supra* note 225.

233. *Leader in Soviet Georgia Says Gas Killed Some Protesters*, WASH. POST, Apr. 25, 1989, at A10.

234. CWC, *supra* note 93, art. II § 7; see Glasser & Baker, *supra* note 216; Wax et al., *supra* note 219; Caryl, *supra* note 212. If the chemical (as in the Moscow theater incident) is employed for “law enforcement” purposes other than “riot control,” perhaps the CWC requirement of short-duration effects is less applicable. See Ruppe, *CWC: Experts Differ on Whether Russian Hostage Rescue Violated Treaty*, *supra* note 225.

LETHAL AND NON-LETHAL WEAPONS

that creates an additional film of legal ambiguity.²³⁵

NLW proponents would also question whether other, non-chemical assault tactics might have ameliorated the situation. Instead of (or in addition to) pumping some form of fentanyl into the theater, what if other non-lethal tools had been available? Could an effective acoustic system have penetrated the walls of the theater and suddenly incapacitated the terrorists; could a millimeter wave device, such as the Active Denial System, have immobilized them quickly enough to preclude their detonation of their explosives? One suspects that even vastly improved “flash-bangs,” intended to stun the targets by sudden bursts of dazzling light and sound, would have been insufficient here—well-trained, disciplined, and committed terrorists might have triggered their doomsday on mere seconds’ notice.²³⁶ Likewise, even powerful malodorants might not have driven the Chechens out of the theater before carrying out their threats. In any event, after the *spetsnaz* found the unconscious terrorists inside the theater, why did they preemptorily execute them, instead of immobilizing them with sticky foam, modern plastic handcuffs, or other secure, easy-to-apply non-lethal restraint systems, disarming them, and taking them prisoner?²³⁷

* * *

In sum, the Moscow confrontation is still difficult to assess. The surreptitious injection of a supposedly non-lethal knockout gas killed

235. *Spetsnaz: Russia’s Elite Force*, BBC NEWS, Oct. 28, 2002 (noting that the 1500-2000 man counter-terrorist Alpha unit has seen extensive action in Afghanistan and Chechnya), at <http://news.bbc.co.uk/1/hi/world/europe/2369273.stm>; *Gas “Killed Moscow Hostages,”* BBC NEWS, Oct. 27, 2002 (quoting Lev Fyodorov, president of Russia’s Union for Chemical Safety, as claiming that “[t]his was a military operation using non-lethal chemical weapons developed during the cold war. . . . They would have been intended for a military opponent.”), at <http://news.bbc.co.uk/1/hi/world/europe/2365383>; OLIKER, *supra* note 212, at 8, 28, 60 (describing use of *spetsnaz* in combat in Chechnya); Ruppe, *CWC: Experts Differ on Whether Russian Hostage Rescue Violated Treaty*, *supra* note 225; Ruppe, *United States: U.S. Military Studying Nonlethal Chemicals*, *supra* note 229; Mark Wheelis, *Will the New Biology Lead to New Weapons?*, ARMS CONTROL TODAY, July/Aug. 2004, at 6; Wheelis, *supra* note 217.

236. *See Spetsnaz: Russia’s Elite Force*, *supra* note 235 (observing that the *spetsnaz* forces lack much of the sophisticated gear (e.g., night vision goggles and other surveillance equipment) that is standard among Western elite corps).

237. *From Idea to Invention*, Techbeat (Nat’l Law Enforcement & Corrections Tech. Ctr., National Institute of Justice), Spring 2001 (describing advances in handcuff mechanisms and in restraint systems that can quickly and reliably secure suspects); *see* Caryl, *supra* note 212 (taking the terrorists as prisoners for interrogation, instead of killing them, might have produced considerable intelligence value). Killing an unconscious combatant who has already been rendered *hors de combat* may also constitute a violation of the law of armed conflict.

over 125 hostages and seriously injured scores more of the very people it was supposed to help rescue. On the other hand, some 700 Russians and others survived their encounter with a most brutal terrorist—a far better outcome than most would have predicted on October 25, 2002. The theater building was damaged by the assault and the shootout, but none of the terrorists' 250 pounds of explosives detonated, precluding a much wider swath of destruction. All of the terrorists, but none of the *spetsnaz* troops, perished.

Both Russian President Vladimir Putin and U.S. Ambassador to Russia Alexander Vershbow pronounced the raid a qualified success, but only when judged by the most desperate criteria, comparing the outcome to the complete disaster that could have eventuated. Both governments also rightly assigned the real culpability for the disaster to Barayev and the scourge of terrorism.²³⁸

Some of the fatalities could surely have been avoided if not for the dark Soviet propensity for secrecy. Even if legitimate concerns for operational security might have inhibited informing medical teams in advance about what tactics the special forces would employ, there was no valid reason to refuse to disclose, after the assault, exactly which chemicals had been used, in what concentrations, and what antidotes might prove most availing. And the continuing secrecy over hospitalizations, morgue activities, and private lawsuits only fuels conspiracy theories and impedes intelligent “after action” analysis of lessons learned.²³⁹ Shooting the unconscious terrorists where they lay instead of disarming them and taking them prisoner also reflects a most troubling tactical choice and perhaps an under-appreciation for modern NLW tools that could immobilize and render harmless even desperadoes who had strapped explosives to their own bodies.

Given the fanaticism of the Chechens, it may have been impossible to negotiate a peaceful outcome: nothing short of precipitous Russian capitulation would likely have ameliorated the crisis. But Russia is not the only place that such a scenario could have taken place: hostage/barricade situations of varying scales are all too common, inspired by terrorism, organized crime, domestic disputes, and drug impairments. In the same vein, future confrontations of this sort may echo the Moscow experience by engaging, in some fashion, both the military special forces and the domestic law enforcement apparatus. It is still not clear how well the Dubrovka Theater incident fits into the neat

238. Baker, *supra* note 218.

239. Glasser & Baker, *supra* note 216.

LETHAL AND NON-LETHAL WEAPONS

dichotomies of military versus law enforcement and international versus internal. Nor is it yet clear how well Moscow's behavior, both before and during the confrontation, complied with the obligations of international law under the Chemical Weapons Convention.

The hope that technology—especially modern biochemistry—can provide a better solution to these tragedies-in-the-making is equally widespread. In these agonizing scenarios, we earnestly wish for some magic calmativie potion that would instantly, safely, and totally incapacitate the combatants, a lightning strike that could free the hostages, defuse the explosives, seize the firearms, and incarcerate the malefactors. But that sort of anesthetic pixie dust is currently unavailable; in fact, it may never be achievable. Although it is always risky to venture that something could “never” be invented, Elisa Harris may have it right, at least for now, when she asserts, “The whole idea of nonlethal chemical warfare agents is a myth. Anyone who tries to suggest otherwise is ignoring the evidence.”²⁴⁰

VI. THE BRITISH AND THE IRAQIS IN BASRA IN 2003

Finally, the Article turns to a third case study, an instance of conventional, or nearly conventional, military combat—when modern troops are engaged in military operations in urban terrain (MOUT), many of the ordinary verities of warfare are suspended or modified. The wrestling in Iraq at the outset of Gulf War II revealed many of the characteristic difficulties of fighting in an environment in which armed enemy troops are intermingled with civilians and with irregular, non-uniformed—but no less deadly—opponents, and in which the troops' assigned mission may creep inexorably forward.

A. *Background on the Basra Confrontation*

Basra, Iraq's second largest city, is situated in the southeast of the country at the confluence of the Tigris and Euphrates rivers. It commands Iraq's only port (on the Persian Gulf), and its population (variously estimated as between one and two million) is squeezed between Kuwait to the south, Iran to the east, and the rich Rumeila oil fields to the west. Importantly, sixty percent of the residents are Shia Moslems, the sect which is numerically more common in Iraq, but which was for decades repressed by Saddam Hussein and his predomi-

240. Gugliotta, *supra* note 229 (quoting Elisa Harris, former Clinton Administration National Security Council official).

nantly northern Sunni Moslem brethren.

In the run-up to the 2003 invasion, the United States, the United Kingdom, and their coalition partners fashioned a battle strategy emphasizing speed and flexibility, as well as overpowering force, with the intention of stampeding into the capital as quickly as possible and deposing Saddam Hussein. An immediate objective in that progression was to pounce on Basra; the U.S. forces would quickly dispatch any organized resistance in the area, then advance north toward Baghdad, leaving to the British forces the tasks of quelling any lingering pockets of resistance in the south and occupying Basra. The expectation was that an immediate show of overwhelming force (the “shock and awe” campaign), coupled with local antipathy to the regime, might lead to a prompt negotiated surrender of Basra within only a day or two, obviating the need for prolonged localized fighting. Basra could then become a shining illustration of the Iraqis’ anti-Saddam fervor, of Westerners greeted as liberators, and of the benefits a city could obtain through cooperation with the foreigners.²⁴¹

Basra was defended by a surprisingly small force, consisting of perhaps only one or two thousand fighters, including remnants of the 51st Mechanized Division, armed with second-class equipment, such as outmoded Soviet-era T55 tanks. These less-than-frontline troops were supplemented by a few hundred *fedayeen*, the irregular militia of poorly trained but ruthless and fanatic devotees of Saddam Hussein and his Ba’ath party. In command of the city was the notorious Ali Hassan al-Majid, a cousin of the dictator who had earned the nickname “Chemical Ali” for his brutal 1988 campaign, featuring illegal use of chemical weapons against the rebellious Kurds in the northern part of the country.²⁴²

The coalition’s initial concept of operations called for the British to advance up to, but not into, Basra; the forces would pause there, anticipating a surrender of the city, perhaps to be spurred by a spontaneous, indigenous Shia uprising against their long-time repressors. At all costs, the invaders wanted to avoid the specter of prolonged

241. Victor Mallet et al., *Attack on Basra Begins with Land and Sea Assault*, FIN. TIMES (London), Mar. 21, 2003, at 4; Richard Norton-Taylor et al., *British Elite Troops Push Towards Basra*, GUARDIAN (London), Mar. 21, 2003, available at <http://www.guardian.co.uk/international/story/0,,918817,00.html>.

242. Norton-Taylor et al., *supra* note 241; Dexter Filkins, *A Nation at War: Southern Front; As Many Iraqis Give Up, Some Fiercely Resist*, N.Y. TIMES, Mar. 23, 2003, at B1; *‘High Risk’ as Desert Rats Battle for Basra*, YORKSHIRE POST, Mar. 25, 2003; Keith B. Richburg & Susan B. Glasser, *Iraqi Tanks Try to Break Out of Basra: British Troops Bombard City*, WASH. POST, Mar. 27, 2003, at A23.

LETHAL AND NON-LETHAL WEAPONS

street fighting in Basra: the laborious process of a house-by-house campaign against the *fedayeen* would be both costly in terms of British soldiers' lives and devastating to the process of building Iraqi support. If the Iraqis' city were turned into a battleground, the residents would surely despise an army that succeeded in "liberating" them only by destroying their homes and businesses and killing innocent civilians.²⁴³

The first phases of the war went basically according to plan: the ground invasion began on March 20, 2003, and within about twenty-four hours, U.S. and U.K. forces had traversed the twenty miles from the Kuwaiti border to the outskirts of Basra. With the British reluctant to jump into the city or to engage in large-scale artillery or airborne strikes against it, the defenders adopted a variety of tactics of "asymmetric" warfare, employing guerrilla, terrorist, and patently illegal maneuvers: they co-located military and civilian sites, placing tanks in residential neighborhoods, military headquarters next to schools, and armed troops at hospitals; they abandoned military or even paramilitary garb, dressing and fighting as civilians; they conducted fake surrenders, amounting to perfidy under the laws of armed conflict; and they used civilians as human shields, grabbing children as cover to preclude British fire.

The coalition forces outside the city occasionally called in targeted bombing, with one such attack destroying the local headquarters of the Ba'ath party (while preserving basically unharmed a neighboring school on one side of the building and a hospital on the other). The strikes also destroyed a television tower that the regime had used to broadcast anti-Western propaganda to the population, some bridges over the region's waterways, the telephone exchange, and electrical facilities.

An odd stalemate then ensued. Some 25,000 coalition troops controlled vast areas of the southern countryside and neighboring desert, but few of the urban areas, and none of Basra. The southern oil fields were protected because they were taken so quickly that the retreating Iraqis had no opportunity to set more than a few wells on fire. Some disaffected or demoralized Iraqi troops surrendered, including one rather substantial group of the 51st Infantry Division, which seemed to augur a repeat of the massive surrenders that had occurred in 1991. Overall, though, the Iraqi troops fought better and surrendered less

243. Norton-Taylor et al., *supra* note 241; Victor Mallet et al., *Division of 8,000 Iraqi Troops Surrenders; Battle for Basra*, FIN. TIMES (London), Mar. 22, 2003; Patrick E. Tyler, *Allies Outside Biggest Southern City; Firefights on the Route to Baghdad*, N.Y. TIMES, Mar. 23, 2003, at A1; Dexter Filkins, *A Nation at War: Southern Front; Eyes on Capital, U.S. Troops Flow Past the South*, N.Y. TIMES, Mar. 24, 2003, at B1.

often than anticipated.²⁴⁴

For two weeks, the standoff persisted, with the British incrementally tightening their grip and the defenders still entrenched within. The British sometimes crept closer, and their air-strikes and artillery firing sometimes had an impact. For example, on March 28, accurate intelligence directed U.S. F15E bombers to a building where the *fedayeen* were meeting, and 200 fighters were killed. On April 5, prompted by another tip, British aircraft battered the home of “Chemical Ali.” Early reports suggested that the despot had been killed, but that turned out to be erroneous; still, it was an important psychological victory, underscoring the new vulnerability of even the top Ba’ath leadership.²⁴⁵

Eventually, the British began probing raids into the city, zipping down Basra’s main corridors in armored vehicles, engaging in brief firefights, and withdrawing. With these tactics, the British were able to demonstrate that the defenders no longer exerted total control over Basra; equally important, they were able to gather information about concentrations of enemy units (to provide targets for subsequent air and artillery fire), to destroy at least a handful of Iraqi tanks and other military equipment, and—by ostentatiously pulling down statues of Saddam and other symbols of the regime—to wage a “psychological operations” campaign against the regime and the *fedayeen*.²⁴⁶

For their part, the Iraqi fighters attempted to lure the U.K. forces into close-quarters street fighting. The British, however, steadfastly refused to be drawn into the city, recognizing that a major assault in the urban terrain would be disastrous for soldiers and civilians alike and hoping that, eventually, intense combat and the inevitable collateral

244. Mallet et al., *supra* note 241; Mallet et al., *supra* note 243; *Welsh Troops Prepare for PoWs*, BBC NEWS, Mar. 22, 2003, at <http://news.bbc.co.uk/1/hi/wales/2875245.stm>; Patrick E. Tyler, *A Nation at War: The Attack; U.S. Bombs Ravage Targets in Baghdad; Waves of Troops Sweeping South Iraq*, N.Y. TIMES, Mar. 22, 2003, at A1.

245. “*Saddam Loyalists*” Bombed, BBC NEWS, Mar. 29, 2003, at http://news.bbc.co.uk/1/hi/world/middle_east/2898013.stm; Michael R. Gordon, *A Nation at War: Military Analysis; Basra Offers a Lesson on Taking Baghdad*, N.Y. TIMES, Apr. 7, 2003, at B1; David Ignatius, Editorial, *Tipping Points*, WASH. POST, Apr. 10, 2003, at A29.

246. “*Saddam Loyalists*” Bombed, *supra* note 245; Gethin Chamberlain, *Troops Relish Basra Statue Raid*, BBC NEWS, Mar. 30, 2003, at <http://news.bbc.co.uk/1/hi/uk/2899717.stm>; Keith B. Richburg, *Standoff at Basra Hints at Tough Time in Baghdad: Allies Have Yet to Face Iraq’s Most Elite Troops*, WASH. POST, Mar. 30, 2003, at A22; Tim Butcher, *Commandos Launch Battle for Basra*, GUARDIAN (London), Mar. 31, 2003, at 7; Keith B. Richburg, *British Use Raids to Wear Down Iraqi Fighters*, WASH. POST, Apr. 3, 2003, at A25 [hereinafter Richburg, *British Use Raids to Wear Down Iraqi Fighters*].

LETHAL AND NON-LETHAL WEAPONS

harm to residents' lives and property would not be necessary.²⁴⁷

Occasionally, groups of Iraqi vehicles attempted an abortive counter-attack—a breakout from Basra, massing for an excursion to the south—such as a group of seventy tanks and other vehicles on March 26. But those columns were quickly obliterated by British fire, with such certainty that observers speculated that only something malicious, such as *fedayeen* threats against the Iraqi soldiers' families, could have impelled them into such a suicidal mission.²⁴⁸

As the standoff continued, Basra seemed to become, not the hoped-for symbol of an easy victory prompted by local welcoming of coalition liberators, but precisely the opposite symbol: an illustration of Westerners getting “bogged down” in the Middle East, stumbling into a tougher-than-anticipated military campaign, with sparse indigenous support. The Westerners were not inflicting casualties upon the Basra residents, but they were being blamed for the slow pace of humanitarian relief and for being overly cautious in dislodging the *fedayeen*. If it took weeks to capture Basra, what could be anticipated as the U.S. and British forces took on Baghdad?²⁴⁹

B. *The Assault: April 6, 2003*

The episodic British incursions into central Basra became more frequent and prolonged, and the troops also began to inch in from the periphery, establishing a camp just inside a key bridge over the Shatt al Basra waterway. On Sunday, April 6, U.K. forces undertook yet another of these in-and-out bursts, this one code-named Operation Sinbad (the legendary Sinbad of 1,001 Nights fame had been from Basra). On this occasion, two convoys (each comprising 28 tanks, 28 other armed vehicles, and 1,500 soldiers) followed distinct routes into the heart of the city, converging at the College of Literature. To their surprise, the U.K. forces encountered significantly less resistance than usual, and on the spur of the moment, they decided to stay, rather than to beat the

247. Keith B. Richburg, *Everyday Life Goes On Despite Siege*, WASH. POST, Apr. 1, 2003, at A17; Keith B. Richburg, *Residents Say Hussein Loyalists in Full Control: Impact of British Siege Described as Minimal*, WASH. POST, Apr. 2, 2003, at A19; Richburg, *British Use Raids to Wear Down Iraqi Fighters*, *supra* note 246.

248. *UK Troops 'Back Basra Uprising'*, BBC NEWS, Mar. 25, 2003, at <http://news.bbc.co.uk/1/hi/uk/2885713.stm>; see also Susan B. Glasser & Richard Leiby, *British See Uprising by Civilians in Basra*, WASH. POST, Mar. 26, 2003, at A1; Richburg & Glasser, *supra* note 242.

249. R.W. Apple, Jr., *A Nation at War: News Analysis; Iraqis Learn the Lessons of How U.S. Fights Wars*, N.Y. TIMES, Mar. 27, 2003, at B1; see Tim Ripley & Paul Gallagher, *Cordon of Steel Tightens on Basra*, SCOTSMAN, Apr. 1, 2003; Richburg, *British Use Raids to Wear Down Iraqi Fighters*, *supra* note 246.

customary hasty retreat to the suburbs. A substantial British force of 10,000 then quickly followed the incursion, occupying critical portions of the city.²⁵⁰

A day of intense—but sporadic and disorganized—fighting ensued. Pockets of hostile fire were uncovered around the city, but the dwindling Iraqi forces were vastly overmatched. Only three U.K. soldiers were killed; perhaps 300 Iraqi fighters died. There were very few Iraqi surrenders: the remaining regular army and militia personnel either fought to the bitter end or, more often, doffed their uniforms and quietly slipped away, leaving Basra and melting into the countryside.²⁵¹

When it became clear that the British forces were there to stay, and that the hated Ba'athists had at last been deposed, the local population reacted with enthusiasm. The residents welcomed the Westerners (at least to the point of expressing gratitude for their assistance, leavened with suspicion about their true long-term objectives) and eagerly identified any hidden resistance fighters or weapons caches. The locals also violently took matters into their own hands against individual antagonists; lynch mobs attacked remaining police, Ba'athists, and others, settling old scores with revenge beatings and vigilante killings.²⁵²

Within only two or three days, most of Basra was relatively secure, but control over some sections—including the historic old city, where the streets were often too narrow for tanks to maneuver—remained dubious. The British suddenly found themselves called upon to play a variety of incompatible roles: they were fighting a conventional war;

250. *Irish Guards Advance on Basra*, BBC NEWS, Apr. 3, 2003, at http://news.bbc.co.uk/1/hi/northern_ireland/2915311.stm; Q&A: *Assault on Basra*, BBC NEWS, Apr. 6, 2003, at <http://news.bbc.co.uk/go/pr/fr/-/1/hi/uk/2922553.stm>; Gordon, *supra* note 245; Craig S. Smith, *A Nation at War: In the Field, Basra; British Assault Captures Half of City in South*, N.Y. TIMES, Apr. 7, 2003, at A1; Keith B. Richburg, *British Forces Enter Basra as Residents Loot City*, WASH. POST, Apr. 7, 2003, at A1 [hereinafter Richburg, *British Forces Enter Basra as Residents Loot City*]; Peter Beaumont & Martin Bentham, *War in the Gulf: After Two Weeks at Bay, British Troops Cut Swath Through Saddam Loyalists: Taking Basra*, GUARDIAN (London), Apr. 7, 2003, at 3, available at <http://www.guardian.co.uk/international/story/0,,931199,00.html>; Rafael Behr & Mark Nicholson, *British Forces Press on in Move to Wrest Control from Saddam Loyalists*, FIN. TIMES (London), Apr. 7, 2003, at 3; David Williams, *The City Fell and Its People Cheered; Iraqis Throng the Streets in Celebration as Basra Is Liberated by British After a Day of Desperate Fighting*, DAILY MAIL (UK), Apr. 7, 2003, at 4.

251. Q&A: *Assault on Basra*, *supra* note 250; “Large Parts” of Basra Under UK Control, BBC NEWS, Apr. 6, 2003, at http://news.co.bbc.uk/1/hi/world/middle_east/2922977.stm; Smith, *supra* note 250; Richburg, *British Forces Enter Basra as Residents Loot City*, *supra* note 250; Williams, *supra* note 250.

252. Beaumont & Bentham, *supra* note 250; Williams, *supra* note 250; Marc Santora, *A Nation at War: The South; The Tides of Revenge in Basra Rise Quickly*, N.Y. TIMES, Apr. 11, 2003, at B2.

LETHAL AND NON-LETHAL WEAPONS

they were engaged in sporadic urban anti-guerrilla operations; and they were also asked to provide a wide range of law enforcement, civil administration, and humanitarian functions.²⁵³

The U.K. forces temporized on the last of those responsibilities, declining to turn their attention to “governance” tasks so long as active combat was still being waged (and, to some extent, not resisting the inclination of many Basra residents to vent their hostility by looting official buildings associated with Saddam). But residents demanded immediate British leadership in quelling the onslaught of looting and street crime. Despite modest disarmament efforts, the city was awash in firearms and no one felt safe. Even Saddam, for all his oppression, had enforced a measure of physical security for the residents; would their British liberators do less?²⁵⁴

As the fighting dwindled, and as the smoke cleared, it became apparent that the city of Basra had indeed been spared the worst ravages of urban warfare. There were plenty of damaged buildings, bombed bridges, and torn up roads, but much of the critical infrastructure remained intact (or, at least, in no worse shape than it had fallen into during Saddam’s reign). Many people were angered at the horrible individual misfortunes of war—bombs that had gone astray or that had accidentally taken their loved ones or their homes—and at the slow pace of refugee assistance. But there were not nearly as many grieving mourners as there would have been following a major urban assault. Humanitarian aid—trucks distributing potable water and engi-

253. Keith B. Richburg, *Lawlessness Spreads in Villages: As Bandits Rove, Allied Forces Are Blamed for Not Enforcing Order*, WASH. POST, Mar. 29, 2003, at A1 [hereinafter Richburg, *Lawlessness Spreads in Villages*]; Peter Finn, *U.S. Hopes Aid, Selective Favors Will Help Win Political Allies*, WASH. POST, Mar. 30, 2003, at A22; Keith B. Richburg, *British Troops’ Dual Role: Soldiers and Relief Workers; Near Basra, Forces Hand Out Food, Water as Fighting Continues*, WASH. POST, Apr. 4, 2003, at A29; Peter Beaumont & Rory McCarthy, *War in the Gulf: British Tanks Force Way into Basra and Destroy Ba’ath Party HQ*, GUARDIAN (London), Apr. 7, 2003, available at <http://www.guardian.co.uk/international/story/0,,931226,00.html>; Charles Clover & Victor Mallet, *Allied Troops Fail to Halt Widespread Looting*, FIN. TIMES (London), Apr. 7, 2003, at 2; Keith B. Richburg, *In Basra, Growing Resentment, Little Aid: Casualties Stoke Hostility over British Presence*, WASH. POST, Apr. 9, 2003, at A23 [hereinafter Richburg, *In Basra, Growing Resentment, Little Aid*].

254. Richburg & Glasser, *supra* note 242; Richburg, *Lawlessness Spreads in Villages*, *supra* note 253; Tim Butcher, *UK Troops Urged to Police Basra*, BBC NEWS, Apr. 8, 2003, available at <http://news.bbc.co.uk/1/hi/uk/2930061.stm>; *UK Aim to Restore Basra Order*, BBC NEWS, April 8, 2003, available at <http://news.bbc.co.uk/1/hi/uk/2927127.stm>; Richburg, *In Basra, Growing Resentment, Little Aid*, *supra* note 253; *British Take on Balancing Act in Basra*, BBC NEWS, Apr. 8, 2003, at <http://news.bbc.co.uk/1/hi/uk/2928615.stm>; Nicholas Watt & Richard Norton-Taylor, *Alarm as Lawlessness Goes Unchecked: Britain to Send Just Two MoD Police to Advise Troops as UN Leads Criticism of Coalition over Collapse of Public Order*, GUARDIAN (London), Apr. 11, 2003, at 4.

neers attempting to restore the electricity grid, running water, and other public services—only very gradually came on-line.²⁵⁵

C. *What Might Have Been*

The question to ponder from this case study is whether advanced non-lethal weapons could have enabled the British to have their cake and eat it, too: i.e., could there have been a mechanism that would have allowed them both to avoid the perils of street-by-street fighting and to come sooner to the assistance of the beleaguered residents of Basra?

Perhaps the answer is no. The fundamental inadequacy of the situation was the difficulty in separating *fedayeen* and other hostile (but often covert) forces from the civilians; where the residents are too terrified to provide the necessary intelligence and identification, there may be little that improved weaponry alone can add to the mix. But for other functions, current or projected NLW enhancements could have served a useful role.

The dilemma of dealing with human shields, for example, might have been ameliorated in some situations if the British had been able, via acoustic or other technologies, to disable everyone within range; the incapacitated could then safely be sorted out at leisure. Likewise, potential suicide bombers (those who volunteered for the horrific duty, as well as those coerced into it) might be identified and frozen by netting at standoff distances, permitting inspection and disarmament. House-to-house combat will always be exceptionally dangerous and destructive, but perhaps some of the worst features can be mitigated by tasers, rubber bullets, and systems that non-destructively penetrate walls to temporarily incapacitate those inside. Perhaps loud noises and blinding lights could have dissuaded the merely curious and driven away the casual hangers-on, enabling the troops to identify more readily those determined individuals who posed the genuine threat. When relief aid does come forward, it is obviously unacceptable to employ deadly force against those who urgently press forward for food or water; perhaps chemical NLW could have helped ensure an orderly

255. Marc Santora, *A Nation at War: In the Field, Basra; British Soldiers' Long Battle for a Southern City's Trust Requires Bullets and Handshakes*, N.Y. TIMES, Apr. 5, 2003, at B3; Richburg, *British Forces Enter Basra as Residents Loot City*, *supra* note 250; Richburg, *In Basra, Growing Resentment, Little Aid*, *supra* note 253; Keith B. Richburg, *People in Basra Contest Official View of Siege: Life Was Mostly Normal, Residents Say; Doctors Report Many Civilians Killed*, WASH. POST, Apr. 15, 2003, at A13; Ryan Dilley, *Basra Bombing "Destroyed My Family"*, BBC NEWS, Apr. 16, 2003, at http://news.bbc.co.uk/1/hi/world/middle_east/2952339.stm; *Basra Utilities "Were Not Bombed"*, BBC NEWS, Apr. 17, 2003, at http://news.bbc.co.uk/1/hi/world/middle_east/2955623.stm.

LETHAL AND NON-LETHAL WEAPONS

and fair distribution process, with less danger of uncontrolled rioting.

Anti-materiel NLW can provide distinct advantages, too. Vehicle checkpoints established on a city's egress routes are notoriously vulnerable; the British might have benefited from vehicle-stopping nets or electro-magnetic pulse systems that could channelize or disable an oncoming car or truck that, for either legitimate or hostile reasons, ignored the traffic control directions. Other types of barrier systems might have protected important facilities from looting. NLW might have quickly and easily created an impenetrable seal on vulnerable buildings, a more effective barrier than the earthen berm built up around one oil company building or the use of deadly firearms, such as by the British unit that fatally shot five bank robbers.²⁵⁶

Instead of catastrophically blowing up valuable infrastructure, perhaps NLW such as slippery foam and carbon fibers could have enabled the invading force to put bridges, roadways, and public utilities out of commission only temporarily, permitting a more rapid return to service when the *fedayeen* left and facilitating the occupiers' efforts to "win the hearts and minds" of the citizenry. A "soft kill" of the telephone system, the television apparatus, and other services could likewise have benefited the invaders in the not-so-very-long run. Regarding the episodic columns of troops and vehicles that bolted out of the city during the siege: if they really were impelled by threats against their families, instead of by misbegotten military strategy, it might well have been more desirable to disable and contain them, via caltrops and ignition arresting systems, rather than by inflicting wholesale destruction and death. NLW might have played a role even in operations undertaken to destroy captured enemy weaponry: a large ammunition dump at the Basra stadium might have been more productively sealed and disabled by non-explosive means.

One potential NLW device was conspicuous by its absence, or at least by its non-use. President Bush had authorized the deployment of non-lethal chemical munitions into the theater of conflict, where some had advocated their potential utility against entrenched resistance. The British, however, rejected any such maneuver as inconsistent with the Chemical Weapons Convention, and, in any event, no chemicals—riot control devices or other—were ever applied by any side on the Iraqi battlefield.²⁵⁷

256. Richburg, *Lawlessness Spreads in Villages*, *supra* note 253; *Last Week in the Iraq War*, WASH. POST, Apr. 13, 2003, at A26.

257. Nicholas Wade & Eric Schmitt, *Bush Approves Use of Tear Gas in Battlefield*, TORONTO STAR, Apr. 2, 2003.

In legal terms, the issue here centers on the law of armed conflict principles discussed above, especially the fundamental principles of avoidance of unnecessary suffering and the mandate for careful discrimination or distinction between combatants and civilians. The *fedayeen* and the Iraqi army manifestly did their best to violate those canons: they intermingled legitimate military targets with protected locations and people and attempted to deter or frustrate the British—or to lure them into the sort of action that would further imperil the non-combatants. The British, on the other hand, did their best to comply with the customary international law, acknowledging that warfare, especially in an urban environment, can never be surgical, but accepting the responsibility to minimize the collateral damage.

* * *

In sum, British patience in Basra ultimately paid off. By waiting until the time was ripe, the U.K. forces avoided what might have been much more protracted and destructive urban combat, with devastating consequences for the invaders, the defenders, and the surrounding civilians. When the assault finally came, there was much less destruction of the city and much less antagonism between occupiers and residents than would have arisen otherwise.²⁵⁸

Still, we cannot help but wonder whether judicious application of non-lethal weapons might have generated an even better outcome. The two-week delay in occupying the city was hardly cost-free: during that interval, the citizens suffered under the multiple burdens of a devastated municipal water system, rampant looting, and rapacious *fedayeen* forces that killed countless individuals. Anything that might have cracked the local resistance more quickly—i.e., tactics or tools that might have ended Basra's anarchy sooner and might have sped coalition forces on their campaign toward Baghdad and the toppling of Saddam—is worth exploring. And the combined firepower of aircraft, artillery, tanks, and other warfighters did, of course, damage the city and kill and injure innocent civilians. Even if the toll was not as high as it might have been, any unintended casualty is regrettable.

Outside observers—and even the British forces themselves—frequently analogized between the ongoing difficulties in Basra and the much more protracted troubles in Northern Ireland. Many of the U.K. troops, veterans of that domestic conflict, were experienced in the

258. Gary Eason, *UK Troops "Lived Up to Expectations,"* BBC NEWS, Apr. 17, 2003, at http://news.bbc.co.uk/1/hi/world/middle_east/2956787.stm.

LETHAL AND NON-LETHAL WEAPONS

nuances of crowd control, the dangers of urban fighting, and the conundrum of providing civil services while promoting law and order. And they were intimately familiar with the role that judicious use of non-lethal weapons can play.²⁵⁹

The final act of the saga of Basra, like that of Iraq itself, is still to be written. The plague of terrorism, the unquenched ambitions of Ba'athist loyalists, and the irregularities of local law and order remain outstanding hurdles. But even there, NLW might play a role in enforcing legitimate authority without further inflaming tensions between occupier and occupied. As one British soldier put it, "We'd hate to win the war but lose the peace."²⁶⁰

VII. CAUTIONARY CONSIDERATIONS

The implicit message of the previous sections must not be over-read. The roster of emerging NLW technologies might, at first, generate a breathless anticipation about future "bloodless conflict," in which U.S. troops and police could one day prevail with only minimal costs to themselves, to innocent civilians, and even to the hostile forces. The three case studies, and the speculations about how NLW of various sorts might have ameliorated the confrontations in Waco, Moscow, and Basra, might generate a knee-jerk mandate to develop, procure, and deploy more of those devices as soon as possible.

But there are important reasons to hesitate before blindly pursuing NLW. Three classes of caveats must be surveyed in any balanced consideration of the future of NLW for police and military applications: "operational" considerations about how the mechanisms might suit the realities of modern law enforcement and conflict; apprehensions about proliferation of the technologies to malign users; and the dangers of encouraging facile over-reliance upon force that must, even with non-lethal capabilities, be exercised with restraint.

A. *Operational Constraints on NLW*

The transition from drawing board to operational field is laden with impediments, and any of the non-lethal weapons concepts discussed above must address several potential pitfalls. This Section briefly notes

259. Keith B. Richburg, *British Forces Confronted by Guerrilla Tactics*, WASH. POST, Mar. 25, 2003, at A1; Matt Maclean, *UK Troops "Trained for Urban War,"* BBC NEWS, Mar. 25, 2003, at <http://news.bbc.co.uk/1/hi/uk/2884667.stm>.

260. *British Plan Joint Patrols in Basra*, BBC NEWS, Apr. 12, 2003, at <http://news.bbc.co.uk/1/hi/uk/2941799.stm>.

some of the constraints that NLW (as any new weapon) must overcome and, not coincidentally, some of the reasons why non-lethals have not yet succeeded in flooding the market for police and military arsenals.²⁶¹

1. Tactical Considerations

Cost is a major consideration: any new system would have to justify its place in the funding queue, and the budgets for police and the armed services traditionally favor the tried-and-true technologies that might be displaced by unproven newcomers.²⁶² Related are logistics concerns: if police and military would be required to maintain two sets of overlapping capabilities—NLW alongside traditional lethal force—the burdens of transportation, maintenance, and supply increase. A police squad car, for example, can pack only so much equipment; when the cop leaves the vehicle to investigate a threatening situation, how much can he or she conveniently carry? A military unit, likewise, would be doubly encumbered if its logistics tail had to include—and if each member had to haul into conflict—both lethal and non-lethal firearms; even if the same weapon could be modified to fire both types of

261. Many in the military have been reluctant to embrace the concept of non-lethal weapons, and progress toward adopting them has been slower than many observers had anticipated. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 73-77 (finding a “wide gap” between the rhetoric of senior Department of Defense officials on the importance of NLW, compared to the limited attention these systems receive in planning, research, and acquisition); Siniscalchi, *supra* note 5, at 129-30, 142-43 (“[T]he defense establishment has been slow to accept these technologies.”); Duncan, *supra* note 9, at 4 n.9:

Generally, commanders will employ only those weapon systems they feel comfortable using. For most commanders, the comfort level for lethal weapon systems is much higher than the comfort level for non-lethal weapons. Raising the comfort level of commanders for non-lethal systems will require a concerted effort by the military services through the implementation of improved training and instruction with respect to their capability and versatility.

Douglas C. Lovelace, Jr. & Steven Metz, *Nonlethality and American Land Power: Strategic Context and Operational Concepts* (U.S. Army War College, Strategic Studies Institute), June 15, 1998, at 12-15, available at <http://www.carlisle.army.mil.ssi.pdf/pud231.pdf>; CFR TASK FORCE 1, *supra* note 7, at ix-xi.

262. Matthew B. Stannard, *Cops Go Ga-Ga over Latest Gadgets*, S.F. CHRON., Sept. 20, 2002, at A21 (describing trade show at which police express great interest in a wide array of NLW capabilities, though budget constraints prevent them from making substantial purchases); NATIONAL RESEARCH COUNCIL, *supra* note 5, at 45-46 (uncertainty over the effectiveness of NLW systems threatens to be a “show stopper” blocking adoption of the weapons).

LETHAL AND NON-LETHAL WEAPONS

rounds, the burden of lugging around two sets of ammunition may be considerable.²⁶³

Another danger is the very real possibility that the NLW will not perform as advertised, and the devices may err in either of two directions. First, a weapon might not prove to be reliably non-lethal; it might inflict fatal wounds or prove poisonous for too many of its targets. Second—at the opposite extreme—it might be ineffective, failing to disable or dissuade the target, compromising the mission and exposing the user to possibly lethal return fire.²⁶⁴

Training is another formidable obstacle and cost. Obviously, police officers on the beat and soldiers in the field must always be properly instructed about any new weapons and afforded adequate opportunities to practice modified tactics before putting them to the test in operation. But that responsibility is even greater here than in other contexts because NLW imply very different strategies for the application of force: these are not merely new tools, but the beginning of a new way of thinking about many law enforcement and military functions. The operators, therefore, will require careful guidance in the new doctrines and concepts of operations. Any weapon is subject to misuse, whether through misunderstanding or malice; thorough, repeated training and leadership can be the best bulwarks against misapplication of NLW.

The military services, sensitive to this imperative, have already devoted considerable resources to NLW training, including dedicated courses for deployed units, for leaders, and for NLW instructors.²⁶⁵ But it must be a perpetual commitment to ensure that the fielded forces are adequately prepared for proper use of their new equipment.

263. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 87-93 (assessing NLW systems for training, effectiveness, logistics and maintenance, vulnerabilities, and countermeasures); *Joint Concept*, *supra* note 5, at A5 (stressing that “commanders must be able to deploy and employ non-lethal systems without sacrificing other critical offensive and defensive capabilities and options”); Duncan, *supra* note 9, at 24-26, 29-33.

264. *See, e.g.*, Eric M. Weiss, *supra* note 45 (suspect resisted police officers despite their use of pepper spray, taser, and handgun); Thomas Farragher & David Abel, *Postgame Police Projectile Kills an Emerson Student*, BOSTON GLOBE, Oct. 22, 2004 (describing shooting by police into unruly crowd with pepper-spray pellets, one of which hit a student in the eye, resulting in death); Parks, *supra* note 117 (noting that even ordinary lethal bullets do not always suffice to disable a person; the popular image of the immediate, overwhelming stopping power of firearms is overstated).

265. Tactical Employment of Nonlethal Weapons, FM 3-22.40, MCWP 3-15.8, NTTP 3-07.3.2, AFTTP(I) 3-2.45, USCG Pub 3-07.31 (joint publication of Army, Marine Corps, Navy, Air Force, & Coast Guard), ch. IV, apps. C-D (Jan. 15, 2003), *available at* <https://www.doctrine.quantico.usmc.mil/mcwp/hum/mcwp3158.htm>.

In addition, as with any other contemplated armament, any NLW system must pass the traditional tests of being sufficiently small, light, durable, and rugged for use in the field, and it must not require elaborate support or care. An NLW system must act quickly, preferably at a range sufficient to keep the user away from a rock-throwing crowd. The system must be immune to adverse weather conditions and must not expose the user to undue smoke, noise, or other toxic or obnoxious effects. Further, the system must not unduly outrage public opinion, and it must not create excessive pollution or other long-term safety hazards. Some NLW candidates can—or will soon be able to—pass these tests, but others will likely remain simply pipe dreams.²⁶⁶

Police and military leaders also have to think about NLW in dynamic terms, anticipating the likely responses of other actors to our deployments of these new weapons. That is, are there simple, inexpensive counter-measures that would be available to a calculating opponent, enabling the targets to evade or blunt the NLW effects? The Davidians were equipped with rudimentary gas masks that might have afforded them some breathing space amidst the CS in Waco; the occupiers of the Dubrovka Theater lacked such foresight, but future Chechen terrorists will likely undertake future missions with better protective devices. (There have been indications that the terrorists responsible for the school massacre at Beslan, Russia in September 2004 did carry gas masks.) In general, any non-lethal weapon that is susceptible to efficient counter-measures will be of greatly reduced value, and we should anticipate the possibility of an action-reaction “arms race” model evolving, with competitive innovations alternating between offensive and defensive capabilities.

Next, there is the “wimp factor” to consider: if our police and military forces come to utilize non-lethal force, and if that posture becomes known to their opponents, will that practice embolden the criminals and enemy troops to resist with even greater zeal? These targeted individuals might then rationally calculate that, if they defy official authority, the worst that could happen would be infliction of a painful or disabling blow, followed by detention; reducing or eliminating the prospect of being shot to death might mitigate the instinct to surrender. It is not just a macho preference for traditional deadly force that sometimes inspires military and police to resist the notion of NLW: in a

266. NATIONAL RESEARCH COUNCIL, *supra* note 5, at 21-22 (summarizing desirable characteristics for Naval NLW), 91-93; *Joint Concept*, *supra* note 5, at A5; Siniscalchi, *supra* note 5, at 141-42; Heal, *supra* note 18, § 4; LEWER & SCHOFIELD, *supra* note 3, at 51-58 (outlining concerns and criteria against which NLW will be assessed).

LETHAL AND NON-LETHAL WEAPONS

world where violence is frequent and sometimes lethal, being armed with more firepower than your opponents is the traditional formula for success and sheer survival.²⁶⁷

2. Legal Considerations

Legal considerations, too, might impede the evolution toward NLW. The treaties and statutes surveyed above circumscribe certain weapons pathways, notably regarding lasers, chemicals, and biological agents. These are especially sensitive fields, and, despite the hypothetical possibility that judicious application of non-lethal chemicals, for example, might humanely save some lives in particular wartime applications, skeptics wisely caution against the danger of undermining the essential arms control constraints of the Chemical Weapons Convention and the Biological Weapons Convention. Most military uses of chemical and biological agents, even for relatively benign NLW applications, are therefore simply off limits.²⁶⁸

A different type of legal concern grows out of the constraints upon official violence reflected in both customary international law and domestic case law. That is, if police and the military are required, pursuant to various formulations, to utilize only “reasonable” or “proportionate” levels of force, would their future possession of NLW capabilities subtly shift that calculation? In short, if police and military forces possess non-lethal capabilities, might they become legally compelled to utilize those restrained approaches first, before resorting to traditional lethal means?²⁶⁹

267. Military personnel often assert a strong preference for the traditional power of overwhelming lethal force, expressing impatience and disinterest in anything perceived as “softer” than conventional bullets and bombs. *See, e.g.*, Parks, *supra* note 117, at 4-5 (quoting a Marine officer as saying that the only “non-lethal” weapon he needed was a Marine with his finger *outside* the trigger guard of his weapon).

268. CFR TASK FORCE 3, *supra* note 21, app. C.

269. A similar progression may be occurring with regard to precision-guided munitions. That is, as the United States develops sophisticated “smart bombs,” capable of targeting particular locations with exquisite accuracy, and as these munitions become much more common in the arsenal, some argue that it may become inappropriate, illegitimate, and eventually illegal under humanitarian standards to use old-fashioned “dumb bombs,” which create much more indiscriminate collateral damage through their imprecision. This purported requirement for using the best technology would not be imposed upon other countries that, due to inferior technology or defense budgets, did not procure the smart weaponry. FUTURE WAR, *supra* note 6, at 197; Danielle L. Infeld, *Precision-Guided Munitions Demonstrated Their Pinpoint Accuracy in Desert Storm; But Is a Country Obligated to Use Precision Technology to Minimize Collateral Civilian Injury and Damage?*, 26 GEO. WASH. J. INT’L L. & ECON. 109 (1992); Schmitt, *supra* note 145, at 9-10; International Humanitarian

Government officials, sensitive to this possibility, have already asserted their opposition to any such trend. The U.S. Department of Defense and NATO have both issued guidance asserting without reservation that self-defense remains the first touchstone for the military; if deadly force is authorized, there is absolutely no requirement or even recommendation that it be approached step-wise, starting with NLW first. Non-lethal capability is intended to augment, not displace, traditional weapons, and it does not alter existing standards for the employment of fully lethal force.²⁷⁰ Likewise, domestic U.S. courts and other authorities reviewing police operations are traditionally deferential to use-of-force decisions, especially those made in exigent circumstances. The Supreme Court's focus on "reasonable"—as opposed to "minimal"—force makes a fine distinction; no cases suggest that police are obligated to procure non-lethal mechanisms for use in threatening and fluid situations.

Still, it is predictable that, as law enforcement and military agents acquire the ability to behave with a more deft touch—to immobilize, incapacitate, or deter, instead of to kill and destroy, and to do so with equal effectiveness and safety—the law may well develop in the direction of requiring them to proceed with the less deadly means first. And that preference may apply even in situations where the opposing forces—due to opposite decisions they made about which weaponry to procure—are not similarly constrained.²⁷¹

B. *The Danger of Proliferation*

It is not plausible to assume that U.S. police and defense forces would proceed alone toward NLW. If the technology works; if it is cost-effective, sufficiently portable, and field-rugged; if it succeeds in

Law Issues in a Potential War in Iraq, *supra* note 145, at 9; *Objects Attacked: The Need for Full Disclosure and Accountability*, *supra* note 145.

270. DoD Directive No. 3000.3, *supra* note 1, § 4.4-4.5; *Joint Concept*, *supra* note 5, at A4; NATO Policy on Non-Lethal Weapons, *supra* note 4, ¶ 4 (observing that “[n]either the existence, the presence nor the potential effect of non-lethal weapons shall constitute an obligation to use non-lethal weapons, or impose a higher standard for, or additional restrictions on, the use of lethal force”); Coppemoll, *supra* note 40, at 121-22.

271. *See* Schmitt, *supra* note 145, at 10 (observing that “[h]umanitarian law is not intended to ensure a fair fight. Rather, it is designed to protect, to the extent possible, those who are not participating in hostilities, and their property, from the effects of those hostilities. It is also calculated to ensure that combatants do not suffer unnecessarily. Suggesting that a party with the technological ability to exercise great care in attack need not do so because its opponent is not similarly equipped runs counter to such purposes.”).

LETHAL AND NON-LETHAL WEAPONS

overcoming resistance from opponents; and if it facilitates our forces' ability to accomplish their assigned missions, then others will mimic our pattern. The imitators may not immediately develop devices that are quite as robust, sophisticated, or safe as what the United States fields, but they may not need to set such high performance standards, and this "reverse engineering" may expose us to a variety of unwelcome new threats.²⁷²

One obvious proliferation danger arises from enemy militaries. Just as the United States might find advantages in inflicting illness, pain, and disorientation upon our opponents, they might discover the same advantages, with the result that our troops may become more vulnerable. A new international arms race in NLW could further burden our military budget and complicate the battlefield; furthermore, there is no certainty that American inventiveness would perpetually ensure an edge for us. An entirely non-lethal war is surely not in sight; whether a conflict characterized by an asymmetric mixture of lethal and non-lethal capabilities would play out to American advantage is impossible to foresee. Already, several other countries are proceeding apace with their own NLW investigations; self-restraint on the part of the United States might not elicit a reciprocal response from them at this point, but it is certainly clear that if we pioneer the field, others—including potential adversaries—will not willingly cede the entire realm of NLW to us.²⁷³

Terrorists, too, might someday piggyback upon the Government's non-lethal weapons research and development work. If (as seems inevitable) the NLW technology slips into the commercial marketplace

272. CFR TASK FORCE 1, *supra* note 7, at 9 (noting that as "the most open, technology-dependent, and vulnerable society," the United States may be particularly susceptible to NLW retaliation); Siniscalchi, *supra* note 5, at 140; FUTURE WAR, *supra* note 6, at 181-82 (observing that the risk of retaliation in kind is a danger with every type of weapon).

273. Duncan, *supra* note 9, at 11-12 (observing that "[a]round the world, many nations are creating non-lethal weapon systems. . . . There will always be foreign governments and terrorists groups who will mimic the non-lethal technology as it is developed" in the United States.); Steve Metz, *Non-Lethality and the Revolution in Military Affairs*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, § 2.1 (observing that "[n]early every advanced state has at least begun to explore the integration of non-lethality in their armed forces, and many have elaborate programmes to develop non-lethal weapons and the operational concepts to use them"); Lewer & Feakin, *supra* note 37, at 127-40 (noting that 110 countries deploy non-lethal riot control agents; presenting a case study of India's use of tear gas and other crowd control mechanisms); J.A.C. Lewis, *France Reverses Policy on Non-Lethal Weapons*, JANE'S DEF. WKLY., Feb. 3, 1999; LEWER & SCHOFIELD, *supra* note 3, at 43-44 (predicting that "non-lethal weapons will become increasingly available through the [international] arms trade"); Peter Enav, *Israeli Army to Use Non-Lethal Shells*, AP, Aug. 23, 2004.

(or the black marketplace), how might terrorists conspire to adapt the ADS system, the vortex ring generator, or the microwave engine-stalling apparatus for their pernicious objectives?²⁷⁴ As Robin Coupland has observed regarding NLW chemicals, “The same agents may be as useful, if not more so, for taking hostages than releasing hostages, or for spreading terror than deterring it.”²⁷⁵

Another, equally problematic form of proliferation would be to domestic criminals. Surely, if people are going to rob banks and convenience stores, it would be better for everyone involved if they did so with tasers and pepper spray, rather than with automatic weapons. The question remains, however, would the easy availability of non-lethal force lead to an even greater incidence of that anti-social behavior? If criminals acquired the ability to immobilize taxi drivers or people on the street—and, *a fortiori*, if they could instantly but temporarily paralyze everyone in a building with a future variant of an acoustic wave system—would they yield to that temptation even more frequently, leading to an enlarged and further empowered criminal force?²⁷⁶

Finally, another category of proliferation causes great concern: the possible spread of pain-inducing NLW technology to human rights abusers. According to U.S. Department of State annual reports, a great many countries around the world still rely upon horrific practices of torture and punishment, either to coerce confessions and information from criminal suspects or to violate, agonize, and deter political opponents or disfavored religious or social groups.²⁷⁷ Many of these

274. Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 94-95 (observing that “[t]errorists armed with ‘non-lethal’ weapons might be even more dangerous than those with only conventional weapons because the ‘non-lethal’ weapons give the terrorists mission flexibility”).

275. Robin M. Coupland, *Incapacitating Chemical Weapons: A Year After the Moscow Theatre Siege*, 362 *THE LANCET* 1346 (2003).

276. Already, non-lethal weapons have occasionally been adapted for criminal purposes: to disarm victims, to effectuate an escape, etc. See *Shoplifting Suspect Squirts Pepper Spray at Officer*, *TheIndyChannel.com*, Aug. 3, 2004, available at <http://www.theindychannel.com/news/3609467/detail.html>; *Police Blotter*, *PALM BEACH POST* (Florida), Aug. 4, 2004, at 16 (OC allegedly used in attempted robbery of convenience store); *North Side Woman Stabs Acquaintance*, *PITT. POST-GAZETTE*, Aug. 4, 2004 (in a fight, one woman used pepper spray to disarm her opponent, then seized the opponent’s knife and stabbed her with it); Davison & Lewer, *supra* note 41, at 13-16 (describing recent crimes committed in various countries using non-lethal weapons).

277. See generally U.S. DEP’T OF STATE, *COUNTRY REPORTS ON HUMAN RIGHTS PRACTICES—2003* (detailing countries’ practices regarding fundamental human rights, including torture, noting many countries where barbaric violations still occur regularly); see AMNESTY INT’L, *ANNUAL REPORT* (2004), available at <http://www.amnesty.org/ailib/aireport/index.html> (annual survey of na-

LETHAL AND NON-LETHAL WEAPONS

torturers satisfy themselves with the most primitive forms of barbarism, through whips, clubs, food deprivation, and the like, but some have come to rely upon more sophisticated—and often Western-supplied—implements such as electric shock devices.²⁷⁸ What additional horrors could they inflict if their arsenals were supplemented with tools such as pepper spray that could be so easily misused? The millimeter wave devices, for example, could inflict outrageous pain, especially upon someone who was physically restrained, unable to retreat and avoid the beam, and they could do so without inflicting any visible wounds or other permanent harm that subsequent investigators could detect and document.²⁷⁹

C. *The Possibility of Over-Reliance upon NLW*

Finally, there is a danger that NLW might work too well, or at least be perceived by the political leadership as succeeding so fully, that the existing—and already quite fragile—constraints upon the use of force were dissipated. That is, if national authorities (wrongly) relied upon the illusion that future NLW could permit the United States to project its power into international crises with appreciably less cost in terms of lives and property, would they be tempted to exercise that power more often? Would American troops find themselves deployed with even greater frequency into tumultuous, perhaps unwinnable, conflicts, because of the facile confidence that non-lethal force would offer a cheap, bloodless triumph?²⁸⁰

tional practices on human rights). Abuses by American military and intelligence officials at the Abu Ghraib prison in Iraq demonstrate additional human rights violations via use of NLW (especially attack dogs) in pursuit of intelligence-gathering or perverse “fun.” DOD INDEPENDENT PANEL REPORT, *supra* note 19; White & Ricks, *supra* note 19.

278. See AMNESTY INT’L, *ARMING THE TORTURERS: ELECTRO-SHOCK TORTURE AND THE SPREAD OF STUN TECHNOLOGY* (1997); AMNESTY INT’L, *USA—MARKET LEADER IN THE TORTURE TRADE* (2001) (detailing U.S. production and export of electroshock weapons and restraints); AMNESTY INT’L, *STOPPING THE TORTURE TRADE* (2001).

279. Steve Wright, *The Role of Sub-Lethal Weapons in Human Rights Abuse*, in *THE FUTURE OF NON-LETHAL WEAPONS: TECHNOLOGIES, OPERATIONS, ETHICS AND LAW*, *supra* note 7, at 75-78; Fidler, *The International Legal Implications of “Non-Lethal” Weapons*, *supra* note 3, at 93-94 (noting that NLW may afford human rights abusers additional tools for torturing their victims while leaving little physical evidence). The vehicle-mounted version of the ADS system is obviously large and expensive, but a human rights abuser might one day be able to procure a less powerful and less expensive “desktop” version, capable of inflicting great pain upon nearby individuals who could not escape from a torture chamber.

280. CFR TASK FORCE 1, *supra* note 7, at 8-11; Siniscalchi, *supra* note 5, at 140-41; Duncan, *supra* note 9, at 9-10. *But see* FUTURE WAR, *supra* note 6, at 180-81 (arguing that congressional

On the law enforcement side, would an enhanced arsenal of NLW prompt officials to send police or FBI into harm's way too quickly, fueling an impatience that should yield, instead, to a more judicious self-restraint and prolonged negotiations? Would an illusion about a completely non-lethal capability lull us into a false sense that police should immediately exercise their ability to "do something" in a crisis, instead of waiting for calmer options?

A related concern: the adoption of additional non-lethal capabilities, consciously translated from military into law enforcement applications, might intensify an ongoing process of "militarization" of the police. SWAT teams have already led that progression, both in the United States and elsewhere, and the effectiveness of those enhanced weapons and tactics is invaluable in certain situations. But surely something is also lost when a community departs increasingly from an older, simpler model of less-forceful policing. There is evidence that violence—even the appearance of readiness for violence—by law enforcement can serve counter-productively to elicit a violent response from a crowd that might otherwise tone itself down.²⁸¹ If police come to possess what they see as a fine-grained ability to modulate their use of force, and if they accordingly sometimes turn to available non-lethal force when they might otherwise have had no real power to do anything at all, might the display of NLW perversely serve to inflame the mob's passions and escalate the controversy?

Finally, a similar issue arises at the tactical level of individual police and military operations in the field. That is, the ready access to an array of effective NLW may allow the uniformed personnel on the street more leeway to "shoot first and ask questions later." There are already suggestions that police, newly armed with tasers, utilize that level of force with surprising frequency. Observers applaud the reduced reliance upon lethal firearms, but worry that law enforcement officials are becoming too "quick on the trigger" with electricity, in a situation where even lower levels of force, and greater levels of patience, might suffice.²⁸²

oversight could check any temptation to allow NLW to put the United States on a "slippery slope" into unwise war).

281. NAT'L ADVISORY COMM'N ON CIVIL DISORDERS, *supra* note 87, at 330 (noting that "use of excessive force—even an inappropriate display of weapons—may be inflammatory and lead to even worse disorder," and citing FBI riot control manual as cautioning that unwarranted use of official force can incite a mob to further violence and prolong a disturbance).

282. Shaffer, *supra* note 34, at 20 (quoting sociology professor John Noakes, "There's a perception that less lethal weapons are a good thing because no one wants to see cops using billy

LETHAL AND NON-LETHAL WEAPONS

In a dangerous, uncertain, and fast-moving milieu, soldiers and law enforcement personnel might welcome tools that reduce the adverse consequences of erroneous, off-target, or premature firing: NLW could minimize the dangers of fratricide and of striking innocent civilians. Instead of sitting back passively and absorbing the first blow, police and military could take the risk of seizing the initiative with NLW. But the question remains: do we really want our protectors to become more proactive in this fashion? Is there an offsetting danger that NLW would inspire too much quickness on the trigger, spurring anticipatory action when greater restraint would be the wiser course?

VIII. RECOMMENDATIONS AND CONCLUSIONS

It is difficult to generalize about non-lethal weapons, owing to the great diversity in the objectives, current status, and future prospects of the various systems. Proponents sometimes refer generally to the “family” of non-lethal weapons programs, but that vocabulary overstates their commonality. The different breeds of NLW are not really closely related, and each must be evaluated on a careful, case-by-case basis for its individual feasibility, legality, and wisdom.²⁸³ Some NLW devices are familiar, having been successfully operated for years; others are just now on the cusp of deployment; still others appear only dimly on the horizon; and a few have already been discarded.

By the same token, perhaps it would be intellectually cleaner not to speak of a category of “non-lethal weapons” at all. If the entrants in this category have so little in common, and if each must be assessed separately, perhaps they should simply be labeled “weapons” and not generically distinguished from any others under that overarching heading. That notion has some appeal; in general, NLW are no more

clubs. But this new technology is frightening because now the police don't have to exercise restraint.”); Berenson, *supra* note 45 (describing a study in Orange County, Florida, which reported that police officers used pepper spray and batons much less frequently after they were also equipped with tasers, but their increased reliance upon the electrical stun guns more than compensated for the decreases in other implements, and total incidents of the use of police force increased by 58%); *Police Sued over Pepper Spray Use*, TENNESSEAN, Dec. 16, 1996, at B1 (alleging that police resort to OC too quickly); Davison & Lewer, *supra* note 41, at 26-28 (reporting controversies and lawsuits asserting inappropriate taser use and police policies regarding use).

283. See U.S. DEP'T OF DEFENSE, JOINT NON-LETHAL WEAPONS PROGRAM, NON-LETHAL WEAPONS, JOINT MISSION AREA ANALYSIS/ JOINT MISSION NEED ANALYSIS, at v (Dec. 2000); U.S. Dep't of Defense, Joint Requirements Oversight Council, Mission Need Statement, quoted in CFR TASK FORCE 3, *supra* note 21, at 7 (both referring to the desirability of pursuing a “family” of non-lethal capabilities).

and no less than “weapons,” and the same rules ought to apply to them as to all others.

But there is much to be gained by exploring the field, or sub-field, of non-lethal arms, apart from all the other types of weapons, and by conceptualizing NLW as a distinct breed. That is, there is something new and different going on here: the conscious effort to create capabilities that have not existed previously (or not nearly to the current extent). These enterprises do have something in common, and we would be overlooking an important development if we merely chalked up all the NLW programs as indistinguishable from other types of weapons. Military and police forces are on the threshold of acquiring important new capacities; these revolutionary technologies may augur correspondingly altered functions and roles. Concerted attention to the field of NLW can help illuminate the policy choices we now face.

To that end, I recommend that the United States pursue non-lethal weapons with increased vigor. There is genuine promise for a host of valuable applications at home and abroad. Of course, not all NLW are equally promising; inevitably, some will be winnowed out, and others will survive the competitive battles for resources, acceptance, and public approval. But the first approach at this point is simply to do more, by investing more time, attention, and dollars into the nascent NLW revolution.

This strategy demands more money, especially at the earliest stages of NLW concept development and research; the commitments to date from both the Department of Defense and the Department of Justice have been paltry. The Joint Non-Lethal Weapons Directorate (JNLWD), in particular, must be re-invigorated and expanded; with its current budget and staffing, it can provide only modest leadership to the military services in identifying and pursuing promising NLW leads, and it can provide even less interaction with domestic law enforcement or with foreign allies. Any specific dollar figure would be largely arbitrary at this point, but the United States should think in terms of an order of magnitude increase over the current JNLWD allotment of roughly \$45 million per year.²⁸⁴

The elusive concept of “visibility” may also be a key here: non-lethal weapons have not yet broken through the consciousness of the key players. Military and civilian leaders in the Department of Defense have routinely proven themselves disinterested, Congress has not seized the

284. CFR TASK FORCE 3, *supra* note 21, at 15-18 (stressing need for more staffing, funding, and visibility for JNLWD).

LETHAL AND NON-LETHAL WEAPONS

issue, and the general public is only vaguely and episodically aware of pending breakthroughs. Somehow, that situation must be changed; the relevant players need to understand more fully what is at stake here and what can be accomplished.

Some of this could be achieved through “top-down” leadership. Senior officials could direct additional resources to this promising, revolutionary field, laying the groundwork for benefits that would be realized years hence. Alternatively, some of the impetus could be felt from the “bottom up,” as the military services and police forces seek better arms for their gun-toters in the field.

Looked at another way, NLW should be a subject of both “technology push” (with research and development laboratories inventing attractive new systems to offer to the military and police forces) and “demand pull” (with individual soldiers and cops asking their superiors for improved tools to achieve their assigned objectives). The problem to date is that the inventors do not seem to understand exactly what augmented capabilities the fielded forces would most appreciate, and the individual cops and soldiers are not aware of what technology might be able to offer. Leadership, therefore, is necessary to ensure a better match-up, allowing the laboratories to respond to, and even anticipate, the demands from the field, and the front lines to articulate better what innovations would best equip them to deal with the novel pressures they now face.

Another component of this effort should be much greater public relations outreach. For whatever reason, the traditional strategy at the Department of Defense has not been to publicize the efforts and achievements in NLW. Perhaps fearing that any program for new weapons at this time might elicit knee-jerk opposition, the Pentagon has deliberately kept a low profile on non-lethal activities across the board. But the consequence has not been *sub rosa* success; instead, public watchdog groups have challenged JNLWD, which has been constrained about putting forward its own perspectives. The public relations battle is one that NLW should be able to win: this is, after all, a quest for a more humanitarian mechanism, a device for accomplishing U.S. objectives with less bloodshed and destruction. But in order to succeed in the public relations arena, JNLWD (and the Department of Justice, for that matter) will have to get into the game; to date, their silence has been deafening.

There are, of course, dangers inherent in non-lethal weapons, and our programs should proceed cautiously in recognition of them. We must continue to insist upon rigorous human effects testing, to ensure that “non-lethal” systems reliably earn that moniker. We have to be

attentive, too, to long-term environmental consequences of some NLW concepts. We must train, as well as equip, the forces, so the new NLW will be used in a manner consistent with the underlying intentions. And we have to be especially alert to the danger that some candidate non-lethal technologies could be diverted for sinister purposes—exploited by common criminals, human rights abusers, or those who would distort these tools for applications of malevolent social control.²⁸⁵

In particular, we should assiduously avoid adverse implications for the slender reeds of arms control. The existing standards of the Chemical Weapons Convention, the Biological Weapons Convention, and other worthy but fragile standards of international law might be jeopardized by unconstrained NLW developments. Riot control agents, in particular, have long exerted a tantalizing allure for military applications, and it is undeniable that in particular scenarios, they might prove a transitory boon. But the world consciously decided, for manifest good reasons, not to go down that treacherous pathway, and even if the treaties were crafted long before modern NLW arose, we should take pains not to unravel that global consensus. Chemical and biological weapons are among the few areas where international law has been laboriously installed to restrict combat violence; those taboos should not be relaxed.

Similarly, the traditional standards of the law of armed conflict must be re-evaluated for the modern era. The greatly enhanced threats from weapons of mass destruction and catastrophic terrorism and the greatly augmented military capabilities offered by technologies such as NLW now require fresh insights from the legal community. The core principles of the law of war retain their vitality, but we are now pressed to think in different ways about how to apply them to an era in which military operations in urban terrain will become even more prominent, in which enemy combatants do not routinely honor the requirements to differentiate and separate themselves from civilians, and in which NLW capabilities such as the VMADS system may be able to “clear a space” by compelling everyone, civilians and fighters alike, to evacuate a neighborhood, avoiding the horrendous cost of street-by-street combat. Implicit in that tactic is the direct or indiscriminate targeting of a weapon system upon civilians located at the periphery of a battle

285. Nick Lewer, *Benign Intervention and Non-Lethality: Wishful Thinking for the 21st Century?*, in NON-LETHAL WEAPONS: TECHNOLOGICAL AND OPERATIONAL PROSPECTS, *supra* note 9, § 8.8 (noting the danger that NLW could be perverted into tools of social manipulation and repression).

LETHAL AND NON-LETHAL WEAPONS

space—not at all a comfortable procedure within the realm of traditional warfare.

One check and balance that can help here—a point already noted above—is publicity. There is little reason to keep secret the NLW technologies that we might develop and procure for domestic law enforcement. Unlike in the military arena, there is less incentive for holding our adversaries ignorant of our current and future capabilities. Being more transparent with our NLW research and development programs, therefore, can help “sell” the legitimacy of the undertaking, enhancing public confidence that the Government is not covertly bent on social manipulation.

More generally, we should be loathe to trigger a new form of international arms race, with countries voraciously competing to invent and deploy still more military capability. Humanity already has sufficient means to conduct warfare; it hardly needs new tools—even non-lethal tools—to further those practices. For that reason, some have already called for treaty negotiations looking to regulate NLW, or at least to channel the emerging programs into safer, less provocative directions.²⁸⁶ At this point, however, that instinct seems premature; articulation of any international restrictions on non-lethal weapons development should be held in abeyance until we have a better idea of which capabilities may be possible and which may be unnecessarily dangerous.

Associated with that conclusion is the imperative of avoiding the type of lazy thinking that could lead to over-reliance upon NLW in inappropriate situations. We must not allow ourselves to be lulled into a false sense that weapons—even relatively safe non-lethal weapons—could be wielded costlessly against foreign or domestic antagonists. Any confrontation must be approached with wisdom and restraint; there can never be a guarantee that NLW will provide a safe, bloodless solution. The continuum of threats faced by police and military units—from a lone gunman all the way up to the paroxysms of Waco, Moscow, and Basra—is inherently dangerous, and the political process must never underestimate those risks or overestimate the ability of NLW to dodge them.

This Article’s analysis of three recent confrontations should not be read as an assertion that NLW would have ensured a better outcome in

286. Rupert Pengelley, *Wanted: A Watch on Non-Lethal Weapons*, JANE’S INT’L DEF. REV., Apr. 1, 1994, at 1; Altmann, *Non-Lethal Weapons Technologies*, *supra* note 48, at 122-23 (calling for “preventive arms control” measures to limit the qualitative improvement in NLW).

Waco, Moscow, or Basra. It is entirely possible that none of those sorry circumstances could have been handled much better, even with an improved arsenal of deft NLW. Perhaps nothing—currently available or in development—could be sufficiently fast-acting, precise, safe, and powerful to be effective against such fanatic, suicidal opponents. Still, it is worth thinking about: these sorts of situations will continue to emerge with some frequency, and if technology can provide any traction in helping to develop a strategy for handling them with greater success, we should explore all the options. As one of the U.S. Government's experts commented upon reviewing the Waco debacle, "Hindsight is of little value except when it is used to provide new solutions to recurring problems."²⁸⁷

A related recommendation arises from the observation that the actors in the three case studies are so independent from each other: the military and the law enforcement NLW efforts seem oddly isolated in the United States, not connected in the manner anticipated by the 1994 memorandum of cooperation between the Department of Defense and the Department of Justice. No doubt, the two enterprises will continue to have different emphases and areas of specialization: the obvious contrasts between all-out international combat and domestic policing inevitably generate important differences in equipment and tactics. But there should be more cross-fertilization. When General Zinni led his Marines into Somalia in 1995, he had to rely largely upon commercial, off-the-shelf equipment and upon the Los Angeles County Sheriff's Department experts for training and tactics. If the Pentagon can bring the deeper pockets to the NLW enterprise, police departments across the country can supply a wealth of prior experience. But the 18,000 local law enforcement departments in the United States are generally too small and disparate to unite in a well-funded NLW research protocol, and they will seek to piggy-back on the Department of Defense development investment. This is not a plea to blur the important lines between police and military—each will continue to have its unique needs and strengths—and still less is it a call to further "militarize" law enforcement.²⁸⁸ But there is a natural synergy between the two types of NLW applications, and both sides would benefit from

287. Cancro, *supra* note 187, at 6.

288. LEWER & SCHOFIELD, *supra* note 3, at 130; NAT'L ADVISORY COMM'N ON CIVIL DISORDERS, *supra* note 87, at 492 (arguing that great harm can result from police use of destructive military weapons); Boyd, *supra* note 9, § 5.3; Coupland & Loye, *supra* note 134, § 7.5. *But see* Bunn, *supra* note 93, at 395 (noting the view of the U.S. Government, expressed at the United Nations in 1966, that it would be anomalous to prohibit military forces from using chemical devices in interna-

LETHAL AND NON-LETHAL WEAPONS

greater interaction.

The new mission of providing homeland security amidst a variety of foreign and domestic threats is a most challenging undertaking, engaging both military and law enforcement assets and a variety of other first responders. It is terribly complicated to prepare to battle terrorists both at home and abroad; to conduct dangerous missions in the midst of civilian populations; to be trained and equipped to undertake both lethal and non-lethal missions interchangeably. But that complexity is now a fact of life; regrettably, but unavoidably, our military and police guardians must now adapt themselves and their weaponry to the confusing, still-evolving threats and missions, and NLW can make a unique contribution.

A variety of factors will, and should, push us increasingly into the realm of NLW.²⁸⁹ The concept of non-lethal weapons is (or, at least, should be) both more effective and more humane, sparing civilians and operators alike some of the worst predations of conflict. Especially in an era when warfare impacts non-combatants with increasing frequency and brutality (in recent international and internal fighting of various sorts, upwards of 80% of the casualties have been civilians), NLW should be welcome.²⁹⁰ At the same time, the impetus toward non-lethal weapons is not simply to be “nicer” to our opponents. The devices are intended primarily to provide better mechanisms for accomplishing the mission. They enable police and the military to behave more flexibly, more deftly, and more precisely, all of which translates into greater effective power. In too many current situations, our officials’ hands are tied; in the absence of tools of finesse, they may be paralyzed by the chasm between lethal over-reaction and feckless inaction.

Non-lethal weapons, as a result, may also provide a benefit of greater public acceptability. It is, of course, far from guaranteed that the community will warm to these unfamiliar technologies: chemicals, biologicals, and blinding lasers have helped put the worst foot forward for NLW, and it is hardly surprising that many people greet the prospect of new, still-mysterious weapons with distrust. Still, in the long run, rubber bullets are better for use against crowds than are real bullets; a soft kill of an enemy power plant will play better than would more permanent destruction; the VMADS millimeter wave system, if it

tional combat that police forces were allowed to use against their own citizens for riot control purposes).

289. See generally Heal, *supra* note 18.

290. Coppernoll, *supra* note 40, at 114.

is used properly, will not horrify people the way that bloodshed or other oppressive devices do.

In short, non-lethal weaponry will not replace traditional lethal force in these agonizing confrontations, but should complement it, providing a cheaper, more flexible, more useable capability. There is, of course, always a danger in augmenting the power of governments, even with apparently benign motivations, but in the case of selected NLW, that is a risk worth running. If we continue to want our officers in khaki and in blue to help us and our neighbors out of a wide variety of international and domestic jams, we should start providing them with suitable mechanisms for doing so without using too much force.