THE NEW ATLANTIS
A JOURNAL OF TECHNOLOGY & SOCIETY

Shooting Not to Kill

America's Development and Use of Non-Lethal Weapons

The U.S. military has increasingly found, in its operations around the world, that the weapons in its arsenal are sometimes too lethal—especially in situations where American troops are serving as peacekeepers, as is the case in parts of Iraq and Afghanistan today. This has led to what one Marine lieutenant general calls the "vulnerability gap": the inability of U.S. soldiers to protect themselves against those aggressors whose threats fail to warrant the use of lethal force. Since at least the early 1990s, and quite often since 9/11, military operations have brought U.S. soldiers to crowded towns-turned-war zones where the *deadliest* weapons aren't always the *best* weapons. Especially in situations where enemy combatants use civilians as human shields, or where terrorists disguise themselves as civilians, conventional weapons can make a dangerous situation even worse.

Increasingly, the Department of Defense is turning to non-lethal weapons (NLWs), which it defines as weapons "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." They fill a critical niche, offering soldiers a course of action when force is necessary but deadly force is not justified.

Non-lethal weapons aren't new, of course. Some NLWs are already familiar to Americans from their decades of use by law enforcement, including rubber bullets and stun guns.

The term "rubber bullet" describes both bullets made fully of rubber and also bullets that are rubber on the outside and metal inside. Because they can ricochet unpredictably, injuring people they weren't intended for, they are no longer used by some police forces. In rare cases, they can be deadly; the web-

site of Relatives for Justice, an Irish activist group, lists seventeen individuals (some as young as ten years old) killed by rubber bullets used for crowd control. Dozens of American platoons in Iraq have been issued rubber bullets as part of non-lethal "capabilities sets."

Stun guns are also used by American military personnel. Taser International, a leading stun-gun manufacturer, reported a $1.4 million order for 1,750-3,500 Tasers "for use by the U.S. military" in a June 2005 press release. The Taser works by delivering 50,000 volts of electricity over a distance of 15 to 25 feet; the shock can incapacitate a target for approximately five seconds. When five seconds is not long enough, targets are shocked repeatedly. More than 7,000 American police agencies use Tasers, according to a recent estimate. Their exact lethality is a matter of considerable debate: they have been involved in dozens of deadly incidents, but have apparently never been clearly determined to be the primary cause of death. Taser International says they "only hurt people once for every 15 times they are used," according to *The Economist*. There is no shortage of lurid stories in which police have used Tasers in circumstances that seem inappropriate; a recent article in the *Atlanta Journal-Constitution* points to instances where they were used "on a 75-year-old woman looking for a friend at a nursing home, on a 6-year-old boy, on a 9-year-old mentally ill girl in handcuffs, and on a 13-year-old girl handcuffed in the back of a patrol car." The circumstances of their use by the military are not yet clear; their use may be limited to military police, or they may be given to troops on patrol.

The research and development of new NLWs for the military is coordinated and overseen by the Department of Defense's Joint Non-Lethal Weapons Directorate. Although the directorate's budget is tiny compared to the money spent on other weapons systems, it has doubled in recent years, reaching $45 million in 2004. Some of the NLWs used by the military are of a class that has never been used by domestic law enforcement—including simple, blunt munitions which were used to subdue mobs in Somalia and have been used in Iraq. These munitions only work at short range, which has meant that soldiers have had to be dangerously close to the chaos before they could work. For instance, a February *Washington Post* article reported a violent prison riot in which Iraqi prisoners "could hurl rocks farther than [U.S. soldiers] could fire non-lethal weapons"; the riot was only quelled after prison guards opened fire with M-16s, killing some of the prisoners. The following month, *Inside the Pentagon* described a shift in focus toward research and development of NLWs with longer range and better precision.

It is invariably the most novel and strange NLWs that get the most press attention—like the "Who, Me? bomb" (contemplated by the U.S. military as early as 1945 and intended to simulate flatulence in enemy ranks) and the pheromone-based "Gay bomb" (pro-

posed in 1994 to compel an enemy to "make love, not war"). Both of these have been discussed and joked about widely in the media, although neither was ever pursued. But some of the newest real-life NLWs are pretty bizarre, too. For instance, the Long Range Acoustic Device (LRAD) is a sort of screeching megaphone that can project noises at just over 150 decibels. Too much exposure to that level of noise can cause permanent deafness, but the technology's backers believe that most people even briefly exposed to LRAD's noise would run away. The system has already been used in Iraq, including in Fallujah. Israel has used a similar weapon, dubbed "The Scream," which emits a painfully high-pitched noise.

Another NLW under development—and reportedly to be deployed in Iraq for the first time later this year—is the Active Denial System, a concentrated millimeter-wave beam. Like a microwave oven, it heats moisture. When aimed at a person, the target's skin warms up, and then gets hotter and hotter, reaching 130 degrees Fahrenheit—a point of agonizing, albeit non-lethal, pain. Like the LRAD, it causes targets to run away and crowds to disperse.

Most of the criticisms of NLWs relate to the possibility that the weapons could be overused by troops who think the weapons are safe because they are not intended to be lethal. Other criticism involves the possibility that new NLWs could be used for torture; human rights groups have already complained that the Active Denial System, for instance, could be abused in that way. And some NLWs under development might violate international treaties to which the United States is a party. For example, *Time* magazine has reported on research to create a non-toxic, biodegradable, sprayable antitraction gel "that is so slippery it is impossible to drive or even walk on it." The gel could be used to keep enemies from getting too close to nuclear facilities or other high-security sites at risk for terrorist attacks. And the magazine described possible plans for "bioengineered bacteria" capable of decomposing metal or rendering fuel useless; the idea is to destroy opposing forces' means of advancing without actually affecting opposing troops or civilians.

As valuable as these weapons might be to American troops, they may violate U.S. obligations under treaties forbidding the development of biological and chemical weapons. The antitraction gel, for instance, could conceivably be forbidden under the 1993 Chemical Weapons Convention, which put restrictions on chemicals that "can cause death, *temporary incapacitation*, or permanent harm to humans or animals" (emphasis added). And the antiweapon bacteria might be disallowed by the 1972 Biological and Toxin Weapons Convention, under which the U.S. pledged never to "develop, produce, stockpile, or otherwise acquire or retain microbial or biological agents, or toxins whatever their origin or method of production," unless they are for "pro-

phylactic, protective, or other peaceful purposes."

It wouldn't be the first time that those treaties prevented U.S. troops from using NLWs. The Chemical Weapons Convention, for instance, prohibits the use of riot-control agents "which can produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure." This means that weapons like tear gas—which domestic law enforcement personnel can use—are forbidden to our troops. This has led to situations, as Secretary of Defense Donald Rumsfeld has noted, in which "our forces are allowed to shoot somebody and kill them, but they're not allowed to use a non-lethal riot-control agent."

In the recent Iraq war, America used a variety of precision-guided weapons, and surely spared thousands of civilian lives by doing so. The development of more sophisticated NLWs is just another dimension in America's commitment, no doubt imperfectly realized, to humane warfare. And as the U.S. continues to engage in operations where the goal is to protect and maintain peace rather than just to kill enemies, it may become necessary to revisit and perhaps recast some of the treaties governing the use of non-lethal weapons.