

Beyond the Rubber Bullet - TIME

The U.S. armed forces don't do much shooting anymore. Even in Afghanistan, they engage in more advising and guiding than gunplay. Soldiers today are asked more often to keep the peace or defuse demonstrations, and the last thing they want in those situations is to fire a lethal weapon. That's why the Pentagon is spending more and more research-and-development dollars on weapons that stun, scare, entangle or nauseate — anything but kill.

The U.S.'s nonlethal-weapons programs are drawing their own fire, mostly from human-rights activists who contend that the technologies being developed will be deployed to suppress dissent and that they defy international weapons treaties. Through public websites, interviews with defense researchers and data obtained in a series of Freedom of Information Act requests filed by watchdog groups, TIME has managed to peer into the Pentagon's multimillion-dollar program and piece together this glimpse of the gentler, though not necessarily kinder, arsenal of tomorrow.

DIRECTED ENERGY WEAPONS

Imagine a cross between a microwave oven and a Star Trek phaser: a tight, focused beam of energy that flash-heats its target from a distance. Directed energy beams do not burn flesh, but they do create an unbearably painful burning sensation. The Air Force Research Laboratory has already spent \$40 million on a humvee-mounted directed-energy weapon. Expect to see it in the field by 2009.

ANTITRACTION MATERIAL

Sometimes keeping an enemy down but not out is good enough. The Southwest Research Institute in Texas has created a sprayable antitraction gel for the Marines that is so slippery it is impossible to drive or even walk on it; one researcher describes it as "liquid ball bearings." Spray the stuff on a door handle, and it becomes too slippery to turn. The antitraction gel is mostly water, so it dries up in about 12 hours. It is also nontoxic and biodegradable.

MALODORANTS

Working for the Pentagon, the Monell Chemical Senses Center in Philadelphia has formulated smells so repellent that they can quickly clear a public space of anyone who can breathe — partygoers, rioters, even enemy forces. Scientists have tested the effectiveness of such odors as vomit, burnt hair, sewage, rotting flesh and a potent concoction known euphemistically as "U.S. Government Standard Bathroom Malodor." But don't expect to get a whiff anytime soon. Like all gaseous weapons, malodorants once released are hard to control, and their use is strictly limited by international chemical-weapons treaties.

PROJECTILES

No one likes rubber bullets — not the people being fired at nor the people doing the firing. "It's very easy to put out an eye, to blind someone," says Glenn Shwaery, director of the Nonlethal Technology Innovation Center. "How do you redesign a projectile to avoid that?" The answer is, with softer, flatter bullets, beanbags and sponges that spread out the impact and hit like an open-handed slap from Andre the Giant. Shwaery's team is looking into an even more radical solution: "tunable" bullets that can be adjusted in the field to be harder or softer as the situation warrants. "We're talking about dialing in the penetrating power," he says. "It's the difference between 'Set phasers on stun' and 'Set phasers on kill.'"

WEBS AND NETS

Spider-man has competition. A firm called Foster-Miller, based in Waltham, Mass., has created the WebShot, a 10-ft.-wide Kevlar net. Packed in a cartridge and fired from a special shotgun, the WebShot can entangle targets as far away as 30 feet. Bigger nets can work on bigger targets. The Portable Vehicle Arresting Barrier, developed for the Pentagon by General Dynamics in Falls Church, Va., is a tough, elastic web that springs up from the ground in an instant to block a road. It can stop a 7,500-lb. pickup truck traveling 45 m.p.h. and then wrap around it to trap the occupants inside.

REAL RAY GUNS

Further out on the horizon, the line between weapons development and science fiction becomes perilously thin. Mission Research Corp. of Santa Barbara, Calif., is working on a pulsed energy projectile (PEP) that superheats the surface moisture around a target so rapidly that it literally explodes, producing a bright flash of light and a loud bang. The effect is like a stun grenade, but unlike a grenade the pep travels at nearly the speed of light and can take out a target with pinpoint accuracy. Or picture this: a flashlight-size device, currently in development at HSV Technologies

in San Diego, that transmits a powerful electric current along a beam of ultraviolet light. Shine that light on a human target, and you have a wireless taser that can paralyze targets as far away as 2 km.

DRUGS, BUGS AND BEYOND

Even their supporters agree that "nonlethal weapons" is a dangerous misnomer and that any of these devices has the potential to injure and kill. What is more, some of them may not even be legal. Over the past three months, a chemical-weapons watchdog organization called the Sunshine Project has obtained evidence that the U.S. is considering some projects that appear to take us beyond the bounds of good sense: bioengineered bacteria designed to eat asphalt, fuel and body armor, or faster-acting, weaponized forms of antidepressants, opiates and so-called "club drugs" that could be rapidly administered to unruly crowds. Such research is illegal under international law and could open up terrifying scenarios for abuse. "This is patently quite dangerous and irresponsible," says human-rights activist Steve Wright, who, as director of the Omega Foundation, works with Amnesty International to monitor nonlethal weapons. "What the U.S. invents today, others, including the torturing states, will deploy tomorrow." Just how much is that magic rubber bullet worth to us? Maybe some science fiction should remain fictional. [^]With reporting by Mark Thompson/Washington