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Non-Lethal Weapons:
Implications for Post-Cold War Conflict

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**Nonlethal Weapons:
Implications for Post-Cold War Conflict**

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Nonlethal weapons, a new generation of weapons designed to incapacitate individuals and damage or destroy material while keeping fatalities to a minimum and producing little collateral damage, have received growing attention since the end of the Cold War. They should, as they may represent a fundamental change in the nature of warfare. While previous developments in weaponry have tended to focus on making weapons more lethal (as in the development of the automatic rifle and machine gun) or more effective (for example in the increased accuracy of precision guided munitions), these weapons are different. Their most likely use will be in deterring aggressive individuals without killing them. The implications of the development and deployment of these weapons within the context of the use of force in the post-Cold War era, however, have received less attention than the technical specifications of the weapons.

Analysts and journalists suggest that interest in nonlethal weapons is spurred in part by the public's discomfort with casualties produced in conflict. The American public's current unease over the death of American soldiers, for example, has found a voice in the outcry over U.S. intervention in Somalia, and may have weighed in as a factor in choosing a U.S. response to the crises in Africa in the mid-1990s. In current thinking regarding the American use of force, there is a presumption and an expectation that casualties will be kept to an absolute minimum.¹ This view was buoyed in the United States by the very low American casualties in the Gulf War, and the way in which the war was presented on television, which tended to reinforce the belief that bloodshed could be kept to a minimum. Nonlethal weapons are seen as a way to conduct military missions with minimal collateral damage and thus meet the challenge for a low-casualty conflict.

One author describes nonlethal weapons as “aimed at averting diplomatically unpalatable casualties.”² Another suggests that they might appear as a “public relations gift.”³ Policy-makers are also sensitive to this issue. Les Aspin has said: “If you can achieve military objectives with fewer casualties . . . it’s definitely a plus,” and “I think it weighs on people’s decisions when . . . you have votes in Congress whether to go to war.”⁴ While there may be nothing wrong with attempting to avert unnecessary casualties in war, discussions of these weapons treat them as if they are a panacea for a world facing troubling little conflicts. Articles tend to present nonlethal weapons as something akin to superpowers possessed by cartoon characters, or offer litanies of various types of nonlethal weapons, but with substantially less accompanying thoughtful analysis.⁵

Three examples illustrate this tendency. One article begins: “It sounds like a scene from Spiderman: to prevent criminals from fleeing, a crime fighter launches a grenade that drops a net on the villains so they can’t get away.”⁶ The article is describing “Nonlethal Entanglement Technology,” field tested by the police in New York, and partially financed by the U.S. Army. A second example concerns Somalia. A military analyst describes how during the military operation in Somalia, “some evening news broadcasts in America ran footage of the Ghost Busters movie, showing Bill Murray immobilized by ‘slime,’ in their reports on the non-lethal measures.”⁷ Finally Douglas Pasternak’s article “Wonder Weapons,” in *U.S. News & World Report* is full of comic book-like illustrations, picturing weapons emitting such appropriate onomatopoeia as: “Zap!,” “Smak!,” and “Bzzzzt!,” to describe the all too serious dazzling lasers, vortex weapons, and microwave weapons respectively. These technologies are not science fiction, but rather existing weapons technologies with potential

law-enforcement and peacekeeping functions, which in some cases have already been used and as such deserve more serious reflection. Nonlethal weapons have three important implications which bear further reflection: they may lead to an increased reliance on military interventions, with potentially disastrous results; they may proliferate thereby threatening the countries developing them today; and they raise ethical questions about the future conduct of war.

TYPES OF NONLETHAL WEAPONS

There are two types of nonlethal weapons.⁸ The first type, receiving more notoriety, is designed to be employed against individuals. Some of these weapons have been tested, others are probably in the design stage, while others are merely drawing board ideas. These weapons include: blinding lasers, acoustic weapons, microwave weapons, electromagnetic weapons, adhesives, such as "sticky foam," and lubricants, aqueous foam, and various chemical agents (tear gas for instance). In the long term, there are efforts underway to develop methods for effective mind control. Finally, there are a variety of nonlethal projectiles, such as rubber bullets. Since research on nonlethal weapons is highly classified, it is not precisely clear at what stage these weapons are in their development, or which have been used.

The less exotic nonlethal weapons have seen use. Police forces around the world have deployed several types of nonlethal weapons, including chemical agents, such as tear gas and pepper spray to disperse crowds or subdue individuals, as well as nonlethal projectiles. Tear gas and rubber bullets have been used by the military as well. The more innovative nonlethal weapons have seen some, though minimal, use. It is thought, for instance, that the Soviets

may have used blinding lasers in the war in Afghanistan.⁹ Some U.S. military forces in Somalia, were equipped with blinding lasers, sticky and aqueous foam, and nonlethal projectiles. U.S. forces in Bosnia received sponge grenades as well as rubber ball rounds and foam baton rounds. And U.S. forces in Haiti had nonlethal projectiles.¹⁰

It is worth noting in passing that the use of the term “nonlethal” for these types of weapons is potentially misleading. Everyone working on nonlethal weapons notes that they can be lethal. These weapons are capable of killing individuals, just as a well placed shot from a rifle need not be fatal. This has led some scholars and the National Institute of Justice to label this type of weapon as “less than lethal,” implying that in general the weapon has a low probability of causing death, but could produce fatalities if misused or possibly in exceptional cases.¹¹

The second type of nonlethal weapon is designed to be used against infrastructure or equipment. Targets might include an enemy’s weaponry, communications equipment, or electrical infrastructure. These weapons include: carbon-fiber filled warheads on cruise missiles, which drop reels of wire onto power stations to short them out. Electrical outages could also be caused by electromagnetic pulse generators. Chemical and biological agents could be used to damage or disable vehicles; likewise for adhesives or lubricants.

Carbon-fiber filled warheads, for example, were used successfully during the Persian Gulf War against Iraqi targets. Dropped from Tomahawk cruise missiles, the fibers shorted out Iraqi power plants, which in turn shut down the computers running Iraqi air defense sites.¹² This in turn made the radar sites vulnerable to attack, presumably while keeping potential Coalition and Iraqi casualties to a minimum.

Nonlethal weapons may be employed by four types of actors. Individuals may use some of the less exotic weapons for personal protection. Pepper spray is a common agent in this regard, readily accessible to the consumer. Criminals may use nonlethal weapons as well. In one incident in December 1997, criminals boarded a commuter train in Japan and sprayed the passengers with tear gas in an effort to rob them.¹³ Police are a third group which may employ these weapons to subdue criminals or for riot control. For police, nonlethal weapons can represent an alternative to drawing a gun. A considerable amount of attention has naturally focused on police forces which use nonlethal weapons to determine what impact such weapons may have on the incidence and consequences of police use of force. More interesting here is the potential military uses of these weapons. Much of the research into and development of nonlethal weapons in the United States, for example, is undertaken by or for the military. The use of these weapons by the military raises a number of important questions.

A central question when examining nonlethal weapons is to ascertain under what situations could they be used. It is important to understand that these weapons are not designed to *replace* regular weapons, but rather to augment those weapons. This suggests that nonlethal and more conventional arms are not interchangeable. Rather, nonlethal weapons are designed for specific threats or missions, for which the use of conventional arms would be less effective, more costly or otherwise inappropriate. The American military, which appears to be at the forefront of the development of nonlethal weapons, could employ them in a variety of settings. One way to identify these settings is to first identify the range of possible threats to U.S. national security.¹⁴ Four possible threats may be identified. A classic threat results from a conflict with a powerful state, such as Russia or China. A second type of threat focuses on

aggressive, but more regionally-oriented states, of the nature of another war involving Iraq. A third type of threat comes from states in the developing world, suffering from political, socio-economic, or environmental instability. Responses to this type of threat would involve the use of force in such roles as peacekeeping operations, coordinating with local law enforcement agencies, providing humanitarian relief or protecting U.S. personnel abroad. Finally, a fourth threat for which the military might be suitable concerns emerging transnational issues, such as terrorism, narcotics trafficking, and international organized crime.

Extrapolating the use of nonlethal weapons by the police to the military suggests that the first type of nonlethal weapons--those designed to be used against individuals--seems to be most relevant in responding to the third type of threat. Nonlethal weapons designed to be used against small groups of people would most likely conform to the threats found in peacekeeping, law enforcement, etc. Additionally, they might also be useful in situations of trying to deal with terrorists who have taken hostages or in efforts to capture terrorists. Policy makers in Washington have been touting the possible benefits of using such weapons, particularly in peacekeeping missions, where rules of engagement and policies concerning when peacekeepers can be armed can hinder soldiers' ability to defend themselves.

An additional use would be to protect buildings, for example states' embassies, UN or other international organization facilities, or command centers. Acoustic or microwave weapons could create an effective defensive barrier around a building or area, for example. However, the protection offered here is designed to counter expected attacks: acoustic weapons could be fielded around an embassy and employed if a mob were approaching. These weapons would probably not deter determined terrorists. Finally, some scholars have suggested other

advantages gained from using nonlethal weapons, such as intelligence gained from adversaries captured with nonlethal weapons or the ability to sort friends from foes, without injuring the former.

The second type of nonlethal weapons--those used against infrastructure--might find use in wars involving major powers or regional actors. Destroying infrastructure requires infrastructure which is worth targeting. Communications equipment, power stations, runways, and so forth, are the resources of states; generally not of sub-state actors. In a major war, it seems as if more lethal forms of force will be the norm, but nonlethal weapons could be used decisively at early stages of a conflict to hinder a military's ability to communicate and move equipment.

Additional uses for nonlethal weapons lie in information warfare.¹⁵ A number of nonlethal weapons, including the carbon-fiber filled warheads used in the Persian Gulf war, as well as airborne lasers and microwave generators could be used to attack electronic targets. Again, this is the sort of target which is more likely found in a more conventional war. Perhaps the major issue here for the United States is not using such weapons for this purpose, but rather considering how the U.S. might defend itself from such an attack. The threat to U.S. infrastructure, in such areas as finance or utilities, seems all too real.

NEGATIVE IMPLICATIONS OF NONLETHAL WEAPONS

Three dangers may result from the development of nonlethal weapons: they may increase the risk of war, proliferation may occur, and they may create ethical dilemmas if used

by violating laws of war. The first consideration regarding nonlethal weapons concerns their impact on the incidence of military interventions. It has long been suggested that efforts to manage conflicts, in particular to make them more "civilized" would have the tendency of making them more frequent. That is, if policy makers thought they could fight a clean, decisive, or low cost war, they would more likely consider intervention when contrasted with other foreign policy options.¹⁶

Such a debate has occurred before in the United States. Early on in America's nuclear policy, it became clear that the use of large nuclear weapons would likely be met with similar weapons and the conduct of a war could not meet goals, which could be met with conventional weapons. Some analysts argued for smaller nuclear weapons which could be used on the battlefield. In a sense, these analysts were looking for the similar option between all or nothing--the same sort of flexibility that policy makers today seek for peacekeeping missions, for example. However, the idea that nuclear weapons could be used and a nuclear war could be "won" made other scholars come to see such weapons as a dangerous policy to pursue because they could tempt policy makers to use such weapons and military leaders to consider war fighting strategies in their planning. Nonlethal weapons might play a similar role in military interventions.

Military interventions are a function of the benefits and costs achieved as a result of their use. Benefits are diverse, and include humanitarian benefits as well as national interest considerations. Equally, there are several costs involved in an intervention, including financial and material costs, as well as risks to personnel. There are also domestic political costs of military intervention, particularly when an intervention produces collateral damage. Thanks to

CNN and the expanded coverage of today's media, Americans and the World can learn of any collateral damage--accidental or otherwise--in record time. Collateral damage, then, becomes magnified within ongoing calculations of how to conduct the fighting.

For situations where states like the U.S. or international organizations like the UN perceive high benefit, military interventions, peacekeeping and peacemaking operations, will likely occur. Note, though, that in these cases, nonlethal weapons might not play a large role, since efforts to force one country to relinquish hold on another--as in the Iraq-Kuwaiti case--are more likely to be fought with conventional weapons, for example. The interesting cases are those where the benefits do not seem that substantial or costs are expected to be higher. In those cases, involvement is more uncertain and it is here that nonlethal weapons can be the factor which tips the balance in favor of involvement.

Nonlethal weapons may decrease the costs of involvement in several ways. For example, nonlethal weapons can protect soldiers or peacekeepers, by giving them a method of defense which is much easier to use across situations where complex rules of engagement might prevent other forms of defense. That is, in unclear but potentially threatening situations, nonlethal weapons might be used, when guns may not. Protecting personnel lowers cost to the state or institution considering the use of force. A second way in which nonlethal weapons might lower costs is that they produce fewer casualties and less collateral damage, reducing political costs. A large part of the "selling point" of nonlethal weapons is that they are far kinder than "lethal" weapons.

If, in fact, nonlethal weapons do reduce costs, then they are likely to foster military intervention by states and international organizations, by empowering them in situations which

today seem to be too violent for unarmed observers but insufficiently violent for the use of force. The impact of nonlethal weapons on the frequency of military action, however, depends on how much favor one finds in an internationalist outlook. For those who see powerful states like the U.S. or international institutions as important to controlling instability and insecurity in the international system, nonlethal weapons may be a blessing: they allow these actors to get involved in areas of conflict and instability, where they would otherwise stay out and they minimize damage in military actions which could be much more destructive.

On the other hand, nonlethal weapons can create a false empowerment: by raising the number of interventions, military and financial resources might become over taxed. (It is a reasonable argument, for example, that the U.S. cannot afford to maintain sizable military forces given its economic goals and performance. How many places should the U.S. be sending troops at the same time? This question also applies to the other major powers.) Additionally, there are those who believe that interventions frequently entail more costs than are recognized at the time and that often military interventions go awry. If costs are under exaggerated, then, in this view, nonlethal weapons create the conditions where policy makers might court disaster, by helping push a decision, the consequences of which are likely to turn out to be negative.

Finally, if nonlethal weapons do not actually decrease the costs of intervention, in spite of such a perception, than the results would certainly be worse than if no intervention occurred. An important assumption by proponents of nonlethal weapons is that the use of lethal force is an invitation for the enemy to escalate the conflict. The assumption is that by using nonlethal weapons and dispersing angry crowds, rioters, and the like, there will be no

escalation. Why this is so is not discussed and if in fact the implication is wrong--rioters dispelled by sonic weapons return armed--than nonlethal weapons might only forestall violence, but not actually prevent it.

The main reason that nonlethal weapons might not actually lower costs is because of escalation in a conflict situation. In the nuclear analogy raised above, a country facing the tactical use of nuclear weapons, might respond with strategic nuclear arms. During the Cold War, the idea that a nuclear exchange could be limited to the battlefield, if the Americans and Soviets were involved seemed improbable. Rather, at some point in the conflict, the Americans or Soviets would likely escalate to an all-out nuclear war. Nonlethal weapons face the same challenge.

Assume, for example, that the United States was considering a deployment of troops to monitor elections in a country. Nonlethal weapons could be used to defend against disruptions during the election. However, an opposition group could threaten--and in fact has an incentive to threaten--to use weapons to disrupt the electoral process. Given such a threat, the U.S. would undoubtedly want to protect its troops with regular weapons. Given this greater threat, the benefits of monitoring the election do not seem as relatively large, and the U.S. would have less of a desire to go in, in the first place. Note that the opposition group might prefer the U.S. to use nonlethal weapons if the U.S. does come in, but by threatening large-scale violence, the group may successfully deter the U.S. from involvement in the first place.

The problem is that if a situation escalates to the point where nonlethal weapons cannot be used, either because the size of the group which must be countered grows too large or the group grows too violent, than nonlethal weapons are likely to be abandoned in favor of regular

conventional arms. At that point, we come back to the scenario we are trying to prevent: high cost involvement. This scenario assumes moreover, that nonlethal weapons are substitutes for regular weapons. Rather, it is likely we will find a mix of such weapons in use, and soldiers may prefer to use regular weapons over nonlethal weapons, given the choice. In Somalia, a blinding laser, which had been de-intensified so that it could not blind a person, was used to illuminate a Somali armed with a rocket-propelled grenade, who was then shot by a member of a Navy SEAL team.¹⁷ Given the choice, soldiers may not always use nonlethal weapons and soldiers may not always have time to choose among several weapons, nonlethal or otherwise.¹⁸

There is an additional cost of using nonlethal weapons. Nonlethal weapons that incapacitate individuals leave those individuals presumably in harms way, possibly injured, and possibly with the same goals as before they encountered the weapons. That is, rioters may still want to riot, but at the moment they would not be physically able to do so. At this point, what is to be done with such individuals? One solution is to incarcerate them and treat them as prisoners with all the relevant laws of war applicable. This would seem to add a lot of cost to a mission. In Somalia, one problem was that there were no facilities to detain Somalis that were captured.¹⁹ One could argue that military forces planning on significantly using nonlethal weapons would plan for detention facilities. Thus, either the military would be unprepared or would have to expend additional resources to prepare for those who are the targets of nonlethal weapons.

A second potential danger concerning nonlethal weapons is their proliferation. Proliferation of these technologies to other states and sub-state actors, such as terrorists, gives rise to two dangers. First, the weapons could be used against the U.S. or its allies, both against

U.S. troops in the event of a military intervention or troops stationed abroad. Second, the weapons, specifically those designed to be used against individuals, could find use internally by less than democratic regimes to carry out state-sponsored repression.

First, though, is proliferation likely to occur? Two reasons suggest that it will. The U.S. is not the only nation to have deployed nonlethal weapons and certainly not the only nation researching these technologies. Some NATO members are actively pursuing nonlethal weapons research.²⁰ One report mentions such states as Russia, the United Kingdom, France, Italy, and Israel as states pursuing nonlethal weapons research.²¹ Other states have a variety of reasons to try to obtain these weapons, including the perception that the weapons are a useful addition to the range of weaponry deployed among military forces and the fear that other states (i.e., potential adversaries) will develop and use the weapons. A state which had the ability to engage in information warfare, for example by attacking another state's computer infrastructure, and which also had defenses against information warfare would likely be seen as very threatening to other states. Proliferation is also likely to occur to non-state actors. Certainly attacking a state's commercial air traffic control system would seem to be the sort of act which would appeal to a terrorist.

A second reason that proliferation is likely to occur is based on past evidence. Other weapons have proliferated, and it seems unlikely that nonlethal weapons would follow a different path. Even weapons of mass destruction, which have strong taboos against use, have proliferated, as the nuclear testing by India and Pakistan in 1998 so dramatically demonstrated. More common weapons can now be produced around the world. For example, the Soviet AK-47 rifle is manufactured under license in over 14 countries, and is probably made illegally in a

few others. Weapons proliferate because of demand, and so it seems likely that nonlethal weapons will also proliferate.

-Given proliferation, will there be negative consequences of the diffusion of nonlethal weapons? One possibility is that countries, such as the U.S., which are already targets for terrorist action might see nonlethal weapons, such as those designed to be used against infrastructure, particularly involving information, used against them. Some weapons could also be used against countries involved in interventions (e.g., peacekeeping) or conflict situations. This would probably raise the costs of the conflict for the intervening states. It could also lead to the escalation of the conflict. However, scholars who favor nonlethal weapons argue that while some diffusion of weapons is likely, the threat of such proliferation to the U.S. is minimal because few opponents would likely get such weapons, there is an opportunity cost to obtaining the weapons, and some current nonlethal weapons can be easily countered.²² Note that these scholars often focus on the first type of nonlethal weapons, such as sticky foam, rather than the whole range of nonlethal weapons.

A second consequence of nonlethal weapons is that they may be adapted in support of state sponsored repression. One of the early arguments against the sale of U.S. arms abroad in the 1970s was that, because sales were partly guided by American security concerns *vis-à-vis* the Soviet Union, the U.S. often ended up supporting some fairly disreputable regimes and leaders. Recent American efforts to enact a "Code of Conduct" for the sale of American arms have run into trouble in the Congress. Could the same thing happen today with nonlethal weapons? While the Cold War is over, the U.S. is not likely to aid a repressive regime because it is pro-West. However, the U.S. has a long history of supporting the *status quo* in

its foreign policy, since it represents stability, if not a stable democracy. It is possible that countries might end up transferring nonlethal technologies to states for internal police uses, only to see the end users employ nonlethal weapons in repressive ways. Whether or not this would actually happen is unclear. The danger is that states will develop the weapons faster than they develop policies to use them.

A final implication of nonlethal weapons concerns their place within the international laws of war. Should countries like the United States consider using these weapons at all. Throughout history, there are some weapons that have been deemed too horrible to use, such as the crossbow and very recently blinding lasers and landmines; and about which there are strong non-use taboos, such as for chemical and biological weapons. Is this moment in history a watershed when nonlethal weapons should be banned before their use or the knowledge for producing them becomes common? Two ethical issues support an affirmative answer: nonlethal weapons are indiscriminate and may produce undue suffering.

In terms of the indiscriminate characteristic of the weapon, many analysts note that the weapons may affect not just those targeted by the weapons, but other, potentially innocent bystanders and one's own military forces. For example, once a person has been covered in sticky foam, getting it off can easily ensnare one's own military personnel. Most of the nonlethal weapons, when discussed, are assumed to be deployed much like a non-movable defense, as for example with acoustic barriers. However, if military missions are fluid and the area where they are conducted is fluid, it is possible that many persons who should not be targeted will be as the battle shifts on the ground. Nonlethal weapons of the second type may be even more indiscriminate. Knocking out electrical power, for example, could be very

indiscriminate, affecting civilians.

The degree of suffering is an effect of nonlethal weapons which is more difficult to ascertain. It is not clear that being injured by a nonlethal weapon would be more or less preferable to being injured by a regular weapon. It is possible that nonlethal weapons will reduce suffering, as compared with being shot and will produce wounds that would heal rather than fatalities. If weapons are going to be used, then perhaps ethically they should be nonlethal weapons. However, some of the nonlethal weapons designed to be used against people may cause lasting damage. This was presumably part of the argument against blinding lasers. However, we do not have much empirical information to go in, in determining how much suffering these weapons could produce. Proponents stress the "nonlethality." Skepticism is invited, however, when one is considering any kind of weapon.

RESPONSES TO NONLETHAL WEAPON DEVELOPMENT

Many nonlethal weapons are already subject to existing arms control measures.²³ An agreement to ban some types of blinding lasers was set forth at the 1995 meeting of the Inhumane Weapons Convention conference. Chemical and biological-based nonlethal weapons may be subject to the Chemical Weapons Convention and the Biological Weapons convention, respectively. A first issue for countries like the U.S. is to decide whether it should proceed to develop, test, and ultimately deploy these weapons in face of existing international treaties which would limit their use. To some extent, the answer rests on how one views the world today in the aftermath of the end of the Cold War. The *realpolitik* view suggests that conflict

is still a likely scenario in the international system and given the increasing costs to mounting a full-scale war, states will seek out technologies such as these to keep military missions effective in the 21st century. Given such a scenario, the U.S. and other major powers must at a minimum study these technologies to plan an effective counterstrategy, should nonlethal weapons be used against them.

Conversely, the more liberal view, while it sees the potential for various forms of conflict today, might stress the possibilities for cooperation among states, possibly under the aegis of some international organization like the UN. This would be the best time for states to sign a treaty banning the use of nonlethal weapons and reaffirming applicable existing treaties, since the full benefits of developing such weapons are not yet known (and attractive) and thus in the research and development phase, states are expending resources without seeing much benefit. Before these become sunk costs and states start arguing that they might as well see the R&D through to completion, an effort to ban nonlethal weapons could perhaps best be negotiated.

The overall point behind this analysis is that there are potentially serious costs to the development of these weapons. Policy makers will have to weigh the perceived benefits--more flexible and effective use of force in 21st century scenarios and the benefits that successful military operations would bring--with the possible costs of increased military intervention, the proliferation of nonlethal weapons, and ethical considerations. The overall point to this analysis is that there are trade-offs here, as there are with the decision to develop any new weapon system. While not as critical as the debate over developing the atomic, and then hydrogen bomb, nonlethal weapons are not a panacea for frustrated policy makers, but a tool

of foreign policy with positive and negative consequences.

Endnotes

1. For a discussion of the impact of casualties on the American use of force, see: Karl Eikenberry, "Take No Casualties," *Parameters*, 26:2, Summer 1996, pp. 109-118 and Harvey Sapolsky and Jeremy Shapiro, "Casualties, Technology, and America's Future Wars," *Parameters*, 26:2, Summer 1996, pp. 119-127.
2. David Morrison, "More-Than-Lethal Weapons," *National Journal*, 27:29, July 22, 1995, p. 1919.
3. Vincent Kiernan, "War over Weapons That Can't Kill," *New Scientist*, 140:1903, December 11, 1993, pp. 14.
4. As cited in David Morrison, "War Without Death?," *National Journal*, November 7, 1992, p. 2589.
5. One exception is: Major Joseph Cook, Major David Fiely, and Major Maura McGowan, "Nonlethal Weapons: Technologies, Legalities, and Potential Policies," *Airpower Journal*, Special Edition, (1995), pp. 77-91.
6. Vincent Kiernan, "You Won't Want to Tangle with the NYPD," *New Scientist*, May 3, 1997, p.7.
7. F.M. Lorenz, "Non-Lethal Force: The Slippery Slope to War?" *Parameters*, 26:3, Autumn 1996, pp. 52-62.
8. Descriptions of nonlethal weapons are found in: William Scott, "Panel's Report Backs Nonlethal Weapons," *Aviation Week & Space Technology*, 143:16, October 16, 1995, pp. 50-

51; and Douglas Pasternak, "Wonder Weapons," *U.S. News & World Report*, 123:1, July 7, 1997, pp. 37-46.

9. Laura Spinney, "A Fate Worse Than Death," *New Scientist*, 156:2104, October 18, 1997, pp. 26-27.

10. On Somalia, see: F.M. Lorenz, "Non-Lethal Force: The Slippery Slope to War?" *Parameters*, 26:3, Autumn 1996, pp. 52-62; and David Morrison, "More-Than-Lethal Weapons," *National Journal*, 27:29, July 22, 1995, p. 1919. On Bosnia and Haiti, see: "Army Prepares to Ship Nonlethals to Bosnia," *Defense Week*, 21:17, May 20, 1996.

11. For a definition of "less-than-lethal," see: David Hayeslip and Alan Preszler, "NIJ Initiative on Less-Than-Lethal Weapons," National Institute of Justice Research in Brief, (Washington, D.C.: Office of Justice Programs, National Institute of Justice, U.S. Department of Justice, March 1993), endnote #2.

12. "Nonlethal Weapons Give Peacekeepers Flexibility," *Aviation Week & Space Technology*, 137:23, December 7, 1992, pp. 50-51.

13. "Pickpockets Tear-gas Train Passengers," *St. Louis Post-Dispatch*, December 18, 1997.

14. A second way to think about the situations where nonlethal weapons may be employed is by focusing instead on military missions. At least four uses have been considered appropriate situations for nonlethal weapons: combating proliferation of weapons of mass destruction, information warfare, peace-keeping and peace-enforcement, and operations-other-than-war.

15. David Fulghum, "New Weapons Slowed by Secrecy Clampdown," *Aviation Week & Space Technology*, 148:3, January 19, 1998, pp. 54-56.

16. Les Aspin is quoted as arguing for the opposing relationship, suggesting that the missions come first and the weapons second: "If we are going to do these new missions, new inventions

may be necessary.” The concern is that once the weapons are created and deployed, military leaders and policy makers may see missions where they could be used. See: Vincent Kiernan, “War over Weapons That Can’t Kill,” *New Scientist*, 140:1903, December 11, 1993, pp. 14-16.

17. Douglas Pasternak, “Wonder Weapons,” *U.S. News & World Report*, 123:1, July 7, 1997, pp. 37-46.

18. Interestingly, in Somalia the rules of engagement restricted some nonlethal weapons to situations where soldiers were allowed to use deadly force. In these situations, presumably the danger to the soldiers was so great, that they would very likely choose regular weapons instead. See: F.M. Lorenz, “Non-Lethal Force: The Slippery Slope to War?” *Parameters*, 26:3, Autumn 1996, pp. 52-62.

19. Martin Stanton, “What Price Sticky Foam?” *Parameters*, 26:3, Autumn 1996, pp. 63-68.

20. Brooks Tigner, “NATO Panel to Consider Nonlethal Weapon Guidelines,” *Defense News*, September 28-October 5, 1997, p. 14.

21. Report of an Independent Task Force, Council on Foreign Relations, *Non-Lethal Technologies: Military Options and Implications*, 1995.

22. Lexi Alexander and Julia Klare, “Nonlethal Weapons: New Tools for Peace,” *Issues in Science & Technology* 12:2 (Winter 1995), pp. 67-74. Interestingly, if there is an opportunity cost for opponents to acquire nonlethal weapons, will they acquire the more regular, lethal ones instead?

23. Joseph Cook, David Fiely, and Maura McGowan, “Nonlethal Weapons: Technologies, Legalities, and Potential Policies,” *Airpower Journal*, Special Edition 1995, pp. 77-91.