

Non-Lethal Weapons Theory, Practice, and What Lies Between

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Introduction: On the Need for Non-Lethal Weapons

The possibility of using non-lethal weapons (NLW) in low-intensity conflicts is gradually being understood as a potentially effective military response in asymmetric confrontations. That is, situations in which a traditionally organized military force would have difficulty in carrying out its duties in the face of civil disturbances of the peace or uprisings in urban settings (MOUT - Military Operations in Urban Terrain).

Maj. Gen. Yitzhak Ben-Yisrael, OC General Staff Directorate for Armaments Research and Development (GSDARD), suggested the following definition for such weapons, some two years ago:

Weapons intended to cause those upon whom they are used to sustain injury, without either killing them or causing irreversible damage over time. The function of such weaponry is to deter, confine, remove from activity, paralyze, confuse, stop, neutralize, distract, disperse, isolate, remove from focus or deprive entry of people or vehicles [in a given area].

Despite the attention given to this subject by the GSDARD, the uprisings that began in 2000 have served to demonstrate that the IDF did not have sufficient non-lethal means at its disposal to deal with large hostile mobs. Had such means been at the

disposal of the IDF and the police, it is possible that their handling of these events would have been more successful, with far fewer fatalities among Palestinian and Arab-Israeli protestors. Had this happened, it is possible that the damage to Israel's international standing would have been less great, and the government would not have found itself in the grips of a frustrating PR/media storm.

In the absence of effective non-lethal weapons, Israel had no choice but to opt for a policy of restraint, which in turn led to public pressure on the government to take offensive initiatives. These, in turn, would have played into the hands of the Palestinian Authority. This article will present the claim that it is possible to develop a more dynamic and flexible policy of military restraint by means of the potential that NLWs offer. Such means, had they been available, might have allowed Israel to take the initiative, simultaneously projecting an image of determination while refraining from causing large numbers of fatalities. This, in turn, would have compensated in part for the limitations of a policy of restraint.

The purpose of this discussion, then, is to persuade the relevant authorities of the need for examination of this important issue. By raising the central questions, it seeks to spur discussion of the need for improved understanding and greater knowledge of this new-old subject in general, and specifically its potential for exerting

control over large violent masses of protestors. Recognizing the need for weapons of this sort, and defining ideal-type characteristics for them, will aid in developing appropriate responses for dealing with tactical conundrums faced by the IDF in the El-Aqsa Intifada. For example, how could the IDF selectively deal with Palestinian gunmen using large unarmed masses for cover, while keeping the number of fatalities low, especially among those who are unarmed? With that, the discussion of these issues will point to the fact that the solution suggested here is not by any means a simple one.

I will also present in this article the claim that the relevant standard here is a reduction in the numbers of fatalities. The fewer the casualties, the greater will be Israel's ability to convince the world of its ultimately peaceful intentions, and to blunt attempts to cast it in the image of an overbearing occupying power. In addition, fewer fatalities would greatly ease the difficulties of returning to negotiations at the conclusion of the violence, and to prevent legal entanglements between individual citizens and the security services because of the mistaken use of live fire against unarmed protestors.

This paper is divided into four sections. Following this introduction, I will discuss the difficulties faced by Israel in dealing with violent protests in the Palestinian Autonomy and among Arab-Israelis. Following this,

I will set forth the major characteristics of NLWs, their uses and advantages, in the context of the present Israeli situation. Finally, I will present a conclusion and recommendations. The American conceptualization of the subject is also presented in a separate sidebar, since its underlying logic is different than that of Israel.

The IDF vs. Violent Protests: The El-Aqsa Intifada

Is there a practical solution that would enable the security forces to deal more effectively with violent protests or civil disturbances? In this context, it is worth distinguishing between situations in which use is made of 'hot' weapons (guns, rifles, etc.) and situations in which no such use has been made. While the latter situation was more common in the first Intifada, the former – in which some protestors used 'hot' weapons in the midst of large unarmed masses – was more common in the recent events.

From a tactical standpoint, the IDF performed extremely well in the el-Nakba protests: the Central Command had learned the importance of preparation in advance for possible renewed outbreaks of violence in the Occupied Territories. Despite this, however, the limits of military force were very apparent with the outbreak of the El-Aqsa Intifada. In responding to the outbreaks of violence, the IDF implemented 'Operation High and Low Tide', using snipers to foil the Palestinian *modus operandi* of planting gunmen to fire on the IDF from within large unarmed crowds. This was the result of lessons learned from the riots at the Western Wall, the Nakba protests, and the Days of Rage, and did in fact reduce casualties to IDF

soldiers. However, this tactical achievement did not translate into a political-diplomatic one, since the balance of casualties between Israel and the Palestinians was so heavily skewed. In other words, in addition to the logic which prevails in conventional war, in which the emphasis is on the preservation of one's own force, in this case there is an additional another principle at work – refraining from the use of deadly force as the dominant means of defeating an enemy force. However, since not responding at all does not in and of itself constitute a solution, it is clear that the potential of NLWs must be examined.

This examination is essential because of the fact that a large segment of the Israeli public – which had been conditioned to think in terms of deterrence and punishment – had pressured the government for stronger action. The unstated assumption in this type of thinking is that, since Israel's rivals only understands the language of force, Israel must devote its long-term efforts toward building an appropriate counter-force. *Israel had thus progressively grown into a mindset where deterrence – based on the ability to apply massive levels of force – was the only language at its disposal.* Unfortunately, this mindset cannot provide solutions in situations where deterrence is of limited value or effectiveness.

The IDF had difficulty in trying to negate Palestinian achievements by means of an effective military response to civil uprisings, which were organized with the knowledge of the Palestinian Authority. It may be that the use of non-lethal weapons would have broadened the effective margins

of the IDF's policy of restraint beyond the deadly use of snipers. If, for example, the IDF had possessed non-lethal means for rendering large crowds of protestors disoriented and harmless, it would have been possible to send forces to locate those possessing deadly weapons (who would also have been rendered harmless), and if necessary take them into Israeli custody.

In contrast to the army, the police were not sufficiently prepared for properly for the outbreak of large-scale demonstrations within the Arab sector. While the army had to deal with live fire from protestors, the situation facing the police was more similar to the protests characteristic of the first Intifada. Here too, the use of NLW could have prevented the need for the use of lethal measures, preventing fatalities among Arab-Israelis, and perhaps sparing the need for a Commission of Inquiry.

As things were, the police and the army were forced to send urgent procurement missions abroad, in order to locate effective non-lethal munitions. However, it would seem that there were none to be had: the IDF and the Border Guards needed, among other things, non-fatal bullets that could effectively neutralize targets more than 100m away, while the bullets that could be found on the international market were by and large intended for police and law enforcement officials, and hence designed for shorter distances.

The IDF understood the consequences of spiraling escalation and the danger of a loss of control of events. The posture of restraint that it adopted contributed to a situation in which Israel's PR position was

relatively tolerable in the opening phases of the conflict. This was because the inability of the PA to inflict fatalities on the IDF forced it to adopt terror and guerrilla tactics, as distinct from popular uprisings. However, Israel was then trapped in a doomed paradox of deterrence: the attempt to transfer the logic of rational deterrence theory to the low intensity conflict at hand could not have succeeded. This is because the policy of restraint meant that there could be no credible response; there was thus no chance in using threats of force to influence the profit-loss considerations or intentions of the Palestinian Authority.

On the one hand, this point is perhaps instructive in reference to the difficulty of handling this sort of campaign. However, it also reinforces the claim that had NLWs been used at the opening stages of the conflict, the Palestinian Authority's decision to turn to terror would not have harmed Israel's public image. Had Israel successfully avoided inflicting large numbers of casualties, the subsequent Palestinian use of terrorism would not have earned it international sympathy.

The Conundrum of the Non-Lethal Bullet

The limitations in developing and using NLW can be seen clearly with the problem of the non-lethal bullet. This problem is an example that effectively brings home the difficulty of matching the right type of ammunition to the nature of the mission. The dilemma of the bullet clearly demonstrates the gap between the desire to stop or deter an enemy, without maiming or killing him or her.

At present, the types of bullets that exist on the market are suitable for

police, prison services, peacekeeping and special operations, which are different in their nature than large-scale, violent civil uprisings. In missions such as these, the act of opening fire is itself considered an extremity that is to be avoided, because it carries with it undesirable consequences. For this reason, it is considered a last resort. Munitions manufacturers are presently trying to develop types of bullets that can be

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used effectively in these sorts of 'gray areas', in which police officers or soldiers must choose between two undesirable options: the use of deadly force, or no use of force at all.

The deadliness of a bullet stems from its high muzzle velocity as it leaves the gun barrel, and declines gradually as its kinetic energy decreases. However (and this is the major difficulty) given that non-lethal bullets suffer from a lack of ballistic stability and accuracy, they are not useful for the purpose of selective sniper fire.

With that, it should be noted that American researchers in the National Laboratories in Oak Ridge, Tennessee have succeeded in finding a way to

overcome this. Using specially designed guns and bullets, they have been able to adjust the speed of a bullet by means of calibrating the rate of combustion of the gunpowder in the bullet casing. In addition to controlling the speed, they have apparently also succeeded in developing different jackets for the bullet, including bullets coated in rubber, or bullets with flexible jackets containing capsules of tear gas that would be released upon impact. Moreover, there is now an attempt to design a special laser sight, which would allow the gun to adjust automatically the speed of the bullet to match the range of the target.

Characteristics of NLW, and their Possible Uses

The developments presented above have yet to bear operational fruit. However, they embody the basic concept of NLW, as a term with a broad frame of reference that tries to supply creative, varied solutions for a wide spectrum of threats. The various ideas for research and development focus on a broad range of ideas from different fields, including acoustics, optics, botany, bio-technology, electronics, electromagnetism, and chemistry. The development focuses on two major types of applications: counter-personnel and counter-vehicle (examples of possible applications appear in the accompanying table).

Despite the limitations of development, NLW technologies have won increased momentum in the national laboratories of the US over the last decade. Notwithstanding the considerable resources that the US army invests in NLW-related R&D, it is clear that not all of these categories

can be defined as non-lethal in every case or possible application, since in some of them, the forces used have potentially deadly effect. In accordance with this, it has become accepted to classify some of these weapons into a category called 'less-than-lethal weapons'. However, even this classification is insufficient, and a debate is presently taking place in the US over the usefulness and moral consequences of the use of such technologies. Even so, it would behoove Israel to examine the key points of American concepts on this subject, and examine their cumulative experience, in order to see how it might be adapted to the special conditions that exist in Israel.

Categories of NLW

NLWs are a compromise between deadliness on the one hand and effectiveness on the other. These weapons need to supply a useful and reliable alternative to deadly force. They must thus strike a delicate balance between excessive force, which would endanger the intended target of the weapon in question, and too little force, which would endanger the soldier or police officer making use of it. Also necessary is the ability to adjust the force of such weapons according to need, from momentarily disorienting an enemy all the way up to inflicting temporary paralysis, in order to negate the ability of a given target to pose a threat. In addition, the weapon must be effective at a distance from which the soldier operating it is not directly and immediately endangered by his would-be target, in order to prevent him/her from panicking and use more deadly measures instead. They must have the

ability to prevent an enemy from engaging hostile action, or stop him efficiently without causing him irreversible damage. Finally, effective NLWs must be easily transported and operated in the field, and be effective at longer than usual ranges.

Such ideal-type characteristics would enable a wide spectrum of operations and situations to be handled effectively. Such situations would include: crowd control, the imposition

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of economic and military sanctions, denying access or use of tactical and strategic assets, conflict intervention, military raids, fighting drug trafficking and terrorism, recovery of hostages, urban combat, and others. However, at present there is no weapons system that effectively lives up to these idealized criteria in full.

Returning to the Table: NLWs as an Operational Alternative

NLW is a general name for devices that suit the management of a policy of restraint, while providing control over the level of violence and better control over events, whether faced by a well-organized crowd, or an anarchic mass. Control over the level of

violence can aid in channeling rage and frustration to tolerable levels. However, there is a risk: total negation of the ability to express outrage or protest could lead large groups to vent their frustrations in other, no less dangerous, ways. Awareness of this possible pitfall will ensure that responses stay within the realm of common sense, refraining from adventurism and reducing to a minimum undesired reactions, not to mention irreversible ones.

We now proceed to the main question: How does one overcome the disadvantages of traditional military responses (i.e., the use of deadly force, with all of the negative ramifications that this entails) while preventing a situation in which violence appears to 'pay', and while not removing an important safety valve for the release of tension and frustration? In fact, non-lethal capabilities that are implemented with the intent of deterring or compelling one's rivals have the *potential for stretching the limits of coercive diplomacy*. Israel could have continued to manage the crisis by means of NLWs in the case of a failure of deterrence, while avoiding wholesale escalation.

An example of this will demonstrate the potential that NLWs offer. Were such a system to have been operational at the time, it would have been possible to use sonic interference to disrupt the command and control centers of the Palestinian police and the Tanzim, without using deadly force. This would have given Israel the ability to undertake a *graduated escalation in the use of force*. In the absence of such capabilities, Israel was forced, rather unsuccessfully, to go a different route by using missiles and

The Roots of the American NLW Concept

The budgets directed toward R&D are an indication of the importance that the US places on this field given the threats its armed forces anticipate facing in the new millennium. Three years ago, the US Department of Defense set up the Joint Non-Lethal Weapons Program (JNLWP), which coordinates all of the staff work and the operational and conceptual developments in the field, in accordance with the demands and challenges of the battlefield of the 21st Century. This was set up as part of the perception of the status and the role of the US in the international community in the wake of the Cold War.

According to American estimates, there is a high probability that for the next two decades low-intensity conflicts and small scale contingencies will continue to be common. The military response to these occurrences will include a variety of responses, from demonstrations of force, intervention, peacekeeping or stability-preserving missions, humanitarian assistance, rescue, etc. Accordingly, the international landscape and the New World Order together require a more moderate use of destructive weapons, since conventional weapons possess a potential destructive capability that is well beyond reasonable limits in the contexts of these missions. Therefore its use has become illogical, especially in situations where there are violent confrontations between an army and a civilian population.

The American interest in creating regional security, though a capability to respond to crises and threats in conditions of uncertainty – as well as the unwillingness of modern societies to sustain casualties – has demanded the identification of tools which will provide alternatives for decisionmakers regarding the use of force in order to deter aggression. NLWs, in the American conception, are intended to provide an answer to this need.

A 'basket' of non-lethal means, as described in the table appearing with this article, is necessary because of the power

of the media in conditions of increased globalization. The media and domestic US opinion have thus become the front on which strategic decision is achieved. Therefore, there is a clear need for a variety of responses for different missions that have a complex, paradoxical character, such as Somalia, Haiti, Rwanda and Bosnia.

The capabilities of NLW both complement and expand a given state's



The US Department of Defense's policy is expressed in the Insignia designed for the JNLWP. The shield, whose colors are those of the American flag, symbolizes protection and preservation of life. The sword, which is set among four stars (each one representing one of the services of the US armed forces) is pointed downwards, symbolizing the non-lethal defense of life and peace. The olive garlands symbolize peace and reconciliation. The symbol is superimposed on a map of the world, a symbol of America's global commitment. The symbol is framed by the Latin phrase *Pax Custimus – Vita Custimus* – "to watch over peace is to watch over life"

diplomatic and military options beyond the limits of traditional conventional force. The army will be able to maintain stability and prevent unchecked escalation by means of finding a response relative to the nature and severity of the threat, in place of restraint. The ability to respond proportionally will help to reduce negative effects of the use of force, such as loss of

life, condemnation for the excessive use of force, negative public opinion owing to massive conventional advantages in force, and collateral damage.

Limits in the Applicability of the US Model to Israel

The US Army's peacekeeping missions have been carried out primarily in the regional context of failed third-world states (what are known as support and stability operations - SASO) under UN auspices. By contrast, Israel must deal with a reality in which there is a concerted Palestinian effort to internationalize the conflict between the PA and Israel. Moreover, the US has generally been able to act in environments where the international pressure element was absent, and where there was no 'escalation lever' available for whatever rivals the US had to face. The US was primarily constrained by the need to cope with domestic public opinion, and less with international opinion as a whole. Moreover, it stood before 'new' rivals, while Israel is locked in a struggle with a long-time rival at its borders, a factor which adds the problem of erosion (both of force and of public will) and attrition.

The US Department of Defense defines NLWs as specific weapons systems intended primarily to negate the ability of persons hardware to function, while minimizing the incidence of death, irreversible injury to persons and unnecessary damage to property and the environment. This definition relates to weapons that were designed to be a non-deadly from the first instance, and does not include weapons systems such as information or electronic warfare, or other systems that have non-fatal capabilities that were not a result of its original design concept. Moreover, the term 'minimization' (i.e., of loss of life) is intended to mean a substantial quantitative reduction in comparison to the physical damage caused by traditional military weapons systems that fulfill their objective by means of destroying their targets.

helicopter gunships. Yet the deterrent message that the IDF's helicopter gunships sought to convey by firing on evacuated police structures failed and even had a reverberative effect, harming Israel's international standing as pictures of Israel helicopters launching missiles were shown and re-shown on international television networks. By contrast, had the same helicopters hit the same targets by means of NLWs, it is possible that the punishment effect would have been more effectively brought home.

The only means for dispersing crowds at present is tear gas, but its effectiveness has declined markedly as protestors have developed means to reduce its effects. By contrast, NLW are intended to *better cope with a large target spread over a given land area*. This, in turn, would result in the reduced use of gunfire when seeking to disperse large masses of protesters, and with it the number of individual events in which soldiers might apply faulty judgement and use excessive force.

The application of massive force in the face of a civil uprising would have allowed a victory on the battlefield, though only by incurring unacceptable political-strategic costs. The use of NLWs could enable the IDF to 'square the circle', reducing in the number of fatalities, while negating the achievements of rivals *and helping to prevent the lost of the political-strategic campaign*. The use of NLWs increases the chance of *moving more smoothly to the bargaining and dialogue phase*, thanks to its ability to prevent escalation and contain the extent of the damage. This concept is more suited to limiting the spiral of escalation and avoiding the question of how to conduct a constructive dialogue while blows are

being exchanged – both of which make a return to negotiations difficult. This kind of approach, which recognizes Israel's overriding interest in preventing conflicts and returning to the peace process, is clearly superior than is a concept based on conventional concepts of war or crisis management.

Developing a Doctrine

The various scenarios that have been described above require detailed

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research and analysis since they raise a number of difficult operational problems. Among these: levels of reaction and use of force and the potential of NLWs to 'tie the hands' of police and soldiers. Would they create confusion, or alternatively ease the ability to respond? Should soldiers be equipped to function in teams, or according to some other logic? What is the line between police work and military operations? What should be the policy for escalation? What will be the correct level of use of non-lethal force which would both prevent bloody outbreaks of violence in the future on the one hand while simultaneously passing on a credible deterrent message and a positive PR image? How may settlements and

outposts be better defended? What are the strategic consequences of using such weapons?

A Non-Lethal Arms Race

At present, the various non-lethal weapons technologies remain scattered and disparate. This raises two possible issues. The first of these is the risk of a new arms race, in the field of non-lethal weapons and materiel. This would lead to an escalation in the force of NLWs by each party to the arms race, effectively making them more and more fatal – a development which defeats the purpose of the entire exercise. The desire for inexpensive technologies and 'miracle cures' are liable to create distorted versions of NLW which will have difficulty measuring up to the central criterion of ruling out the creation of technology that takes human life. The danger of blurring the lines between lethal, less lethal and non lethal weapons requires an attempt to set up rules for arms races, and for their development. The duality of the capability to kill vs. the ability to neutralize requires the creation of norms such as preservation of life, environmental sensitivity and non-violation of international conventions in order to create a pattern of fair use of NLWs.

The second risk is a lack of planning due to unexpected developments. Israel must not be lured by a panicked search for solutions into the uncontrolled acquisition of NLWs that exist presently in the market, but do not suit the conditions of the conflict at hand. Every crisis is unique, and requires adapting existing means to suit the mission and the context at hand.

Possible Applications of Non-Lethal Technologies

Counter-Materiel		Counter-Personnel	
Purpose			
Disabling Vehicles, Vessels, and Facilities		Crowd Control	
Area Denial to Vehicles		Incapacitation of Personnel	
		Area Denial to Personnel (AD-P)	
		Clearing Facilities of Personnel (CFAC)	
Means			
Counter-Materiel		Counter-Personnel	
Special EM Interference	Family of devices to provide electronic interference effects.	Infra/Ultra Sound	Sonic generator that projects an acoustic pressure wave to cause discomfort to personnel.
Non-nuclear EMP	Device that duplicates the effects of nuclear electromagnetic pulse, disrupting electronics.	Noise	Acoustic generator that produces sufficient sound to disorient or incapacitate personnel.
High-Voltage Shock	High-voltage generator to disrupt electronic systems.	Malodorous Substances	Family of inorganic substances with pungent odors that cause discomfort to personnel.
Conductive Particles	Family of particles that short-circuits electronics when inserted.	Irritants	Substances that cause eye and respiratory irritation/discomfort
Conductive Ribbons	Family of ribbons that short-circuits electronics when deployed over wires.	Vomiting Agents	Chemicals that cause nausea/vomiting
Radio Frequency	System that radiates a microwave burst, disabling electronics.	Optical Munitions	Family of explosive/electric flash devices to stun, dazzle, or temporarily blind.
Optical Coatings	Family of materials that can be deposited on optical sensors or viewing ports to obscure vision.	Strobe Lights	Large, high-intensity stroboscopic light to disorient and confuse personnel.
Optical Munitions	Explosive/electric flash device to stun, dazzle, or temporarily blind optical sensors.	Aqueous Foams	Family of foams that impede mobility and create barriers especially when mixed with irritants.
Engine Killers	Family of agents that disables or destroys engines.	Water Cannon	System that produces a high-pressure stream of water to disable or disburse crowds.
Fuel Additives and Viscosifiers	Family of agents that cause fuel to solidify.	Deception	Techniques intended to persuade groups to act against their self-interest.
Bio-deterioration	Family of organic substances that corrode structural materials or fuels.	Non-penetrating Projectiles	Family of projectiles that stuns personnel without penetrating.
Super-corrosives & super-caustics	Family of substances that corrode structural materials such as metal.	Super-adhesives, Binding Coatings	Family of adhesives that prevent movement of personnel.
Filter Cloggers	Family of airborne agents that clog air filters when ingested in engines.	Anti-Traction	Family of substances that cause lack of traction for personnel.
Material Embrittlement	Family of substances that cause materials to quickly disintegrate or break down molecular bonding.	Entanglers, Containment Devices	Family of nets, meshes, and the like to ensnare.
Adhesives and Abrasives	Substances that adhere to the surfaces of moving parts of machinery to damage them/prevent normal function.	Enclosure Fillers	Substance or devices that rapidly fill an enclosed space, leaving occupants alive but incapable of movement (e.g., airbags).
Anti-Traction	Family of substances that cause lack of traction.	Stun Weapons	Family of weapons that subdue or immobilize personnel.
Entanglers	Family of nets, meshes, and the like to ensnare vehicles.	Combustible Dispersants	Family of substances that ignite when subject to pressure from personnel passing over.
Soil Destabilization	Family of substances that cause soil to become soft or unstable, thus unusable by vehicles.	Obscurants	Family of smoke-like agents to obscure observation and disorient.
Tire Attack	Family of methods to destroy the tire/wheels of vehicles.	Markers	Family of substances that can be used to covertly mark personnel for later identification. Marking may be overt if so desired.
Combustible Dispersants	Family of substances that ignite when subject to pressure from vehicles passing over.	Voice Synthesis Morphing	Device to synthesize the voice or images of a known figure, to deceive, produce false orders, or gain access.
Obscurants	Family of smoke-like agents to obscure visual or electronic observation.	3-D Holograms	Generator that produces holograms as decoys or deceptions.

Conclusions and Recommendations

Israel must undertake a critical evaluation of the concept of NLW as it is perceived in the US, with an eye toward adapting it for local conditions in which the IDF operates. This is so that its use will serve the security services and the political leadership, in their desire to maximize their achievement on behalf of Israel's national interests.

To carry out this mission successfully, a number of postulates must be remembered, and a number of subjects must be put forward. These include:

1. It is clear that the traditional military responses of operational decision and conquest of territory have no relevance to the question of dealing with low-intensity conflicts such as the El-Aqsa Intifada. The inapplicability of these traditional – and cardinal – principles of military logic create an operational vacuum that could be filled effectively by the development of NLWs according to the logic presented here.
2. The potential advantages of NLWs as a specific tactical response to acute problems such as fighting terror, random shooting attacks, and sniping, must be exploited.
3. Israel needs to develop a 'non-lethal doctrine' which is suited to the needs of the region, and to prevent undesired developments in the field. The doctrine needs to develop a successful operating procedure for dealing effectively with large violent crowds of people.
4. In police-related activities it is worth considering the banning of the use of controversial kinds of weaponry, among them 'plastic' bullets, which do not fall into the category of NLWs because of their capacity to inflict serious injury.
5. The plethora of developments in non-lethal technologies testifies to the importance that the US ascribes to the field. It would be worthwhile for Israel to accelerate its research and development in this field by the defense industries, given the large potential market and the refusal of foreign companies to sell means for dispersing demonstrations. This development must strive for international standards, and must be based on materials that will receive bio-medical approval from drug licensing agencies and human rights organizations. This is in order to prevent criticism when these systems are used in the field.
6. Israel must strive for its strategic partnership with the US to include co-operation in the development of NLWs.
7. Assuming that NLWs which meet the most stringent of criteria can be successfully manufactured, it is important to remember that despite their advantages, the use of NLWs will create a degree of antagonism since the people who will be subjected to its effects will be subjected to intense suffering. This does not constitute an appealing media picture, nor will it necessarily contribute to a more positive public image.
8. War will continue, for the foreseeable future, to remain 'dirty', taking a terrible toll in loss of life. NLWs are not by any means a miracle cure for the horrors of war.
9. NLWs cannot positively promise a breaking of the cycle of violence, though the difficulties that stem from paradoxes of deterrence and decision reinforce the need of developing the applications of this new potential, as part of the transition to complex conditions of battle.

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