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Yearbook of International Humanitarian Law 2018



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Cover picture: An MQ-1 Predator unmanned aerial vehicle and F-16 Fighting Falcon return from an Operation Iraqi Freedom combat mission. Both aircraft provide intelligence, search and reconnaissance gathering features, as well as munitions capability to support ground troops and base defense.

Photo: U.S. Air Force photo/1st Lt. Shannon Collins.

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Editorial

International Humanitarian Law (IHL), law of weaponry and the international arms control architecture as a whole are confronted with a formidable array of challenges. New military technologies are set to revolutionize military affairs and challenge traditional arms control paradigms. At the same time, resurgent big power rivalries and shifting geopolitical power dynamics in the twenty-first century are putting increasing pressure on existing arms control structures many of which are imbued with twentieth century rationales.

Nowhere is this more visible than with regard to nuclear weapons where traditional arms control regimes are currently eroding at an alarming pace. With the demise of the Intermediate-Range Nuclear Forces Treaty's (INF) Treaty and the US's withdrawal from the Joint Comprehensive Plan of Action, better known as the Iran Nuclear Deal, now even the future of the Non-Proliferation and New Start treaties, both of which are due to be reviewed in 2020 and 2021 respectively, is uncertain.

But also beyond the realm of nuclear disarmament there are challenges abound. Prohibited chemical weapons have repeatedly been used in Syria and the possibility of newly emerging generations of biological weapons, based on developments in genetics and genomics, are increasingly a cause of concern. What is more, since Russia's suspension of the Treaty on Conventional Armed Forces in Europe it is clear that the erosion of arms control is not confined to weapons of mass destruction but similarly affects the broad field of conventional weapons control. In addition, the use of explosive weapons in densely populated areas in warzones such as Syria and Yemen as well as the important issue of arms transfers and their restrictions have increasingly come into focus.

Simultaneously, the militarization of artificial intelligence (AI), outer space and cyber space combined with rapid developments in robotics, nano-technology and the field of hypersonic missiles are raising new humanitarian concerns and regulative challenges many of which remain incompletely understood and are in need of further and deeper discussion.

It is against this backdrop, that Volume 21 (2018) of the Yearbook of International Humanitarian Law is devoted to the humanitarian and legal challenges surrounding weapons and new military technologies. The volume starts with a contribution from Mirko Sossai who explores “The Demands of Future Operations and the Promise of Non- or Less-Lethal Weapons” and traces recent developments in this area while considering the specific demands of peace-keeping and law enforcement scenarios and generally military operations aiming to protect the civilian population.

Stuart Casey-Maslen then turns to “The Status of Nuclear Deterrence Under International Law in Light of the Treaty on the Prohibition of Nuclear Weapons” and the delegitimizing impact this treaty has on nuclear deterrence at a time where new technological capabilities such as offensive cyber operations are rendering nuclear deterrents increasingly ineffective. Matthias Brenneke in his contribution on “Lethal Autonomous Weapon Systems and Their Compatibility with International Humanitarian Law: A Primer on the Debate” argues that—at least for the time-being—lethal autonomous weapons systems are incompatible with IHL and that therefore humans must stay in or on the loop to retain meaningful human control. Finally, Joshua Hughes looks into another important dimension of the weaponization of AI and explores “The Law of Armed Conflict Issues Created by Programming Automatic Target Recognition Systems Using Deep Learning Methods” cautioning that this programming method contains inherent limitations such as the inability for the resultant algorithms to comprehend context and the near impossibility to retrace the decision-making process of these algorithms.

In the second part of the Yearbook Beatrice Heuser adopts a historic perspective and looks into “Ordinances and Articles of War before the Lieber Code, 866–1863: The Long Pre-History of International Humanitarian Law” emphasizing, contrary to the common mainstream narrative of IHL textbooks and reference works which tend to depict the American Lieber Code as the starting point of codified IHL, that the Lieber Code was only one in a series of such ordinances that can be traced back in Europe to the ninth century.

As is customary, the Yearbook concludes with a “Year in Review”, this year co-authored by Kilian Roithmaier, Monika Tobjasz and Pauline Bove.

Finally, the members of the Editorial Board would like to extend their warm and sincere thanks to Tim McCormack. Timothy McCormack was General Editor of the Yearbook from Volume 6 (2003) up to and including Volume 11 (2008) and has been Editor of the Correspondents’ Reports from Volume 11 (2008) up to and including Volume 20 (2017). His contribution to the Yearbook in both capacities has been very substantial and valuable in a number of ways. Tim is one of the world’s leading authorities on the law of armed conflict and his scholarship, insight and experience have enriched the Yearbook over all the years of his association with it. Moreover, as anyone who has worked with him can testify, he is a warm and generous person who is a pleasure to know and work with and these qualities

were clearly evident during his long association with the Yearbook. Due to his appointment as Dean of the Law School at his *alma mater*, the University of Tasmania, he has decided to discontinue his activities on the Editorial Board. Tim, many thanks for all your many years with the Yearbook and all the best!

Amsterdam/Breda, The Netherlands
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Terry D. Gill
Robin Geiß
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In order to make the *Correspondents' Reports* immediately and widely available, they can be accessed online at

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This has the added benefit of the reports being fully searchable, thereby better serving the needs of scholars and practitioners.

Part I
Weapons Law

Chapter 1

The Demands of Future Operations and the Promise of Non- or Less-Lethal Weapons



Mirko Sossai

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Abstract Non-lethal technology continues to attract the interest of States, individually and in the context of regional and universal organisations. Peace operations deployed in asymmetric threat environments are in need of equipment more suited to the requirements of such operations: non- or less-lethal weapons might offer a valuable alternative to firearms in certain scenarios, particularly when armed forces are involved in the protection of the civilian population as well as in law enforcement activities. It is important to distinguish between conduct of hostilities and law enforcement scenarios, as different legal paradigms apply with regard to the use of armed force. Moreover, whereas under the latter, there is at least an implicit

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obligation under human rights law to equip State officials with less-lethal weapons, the prevalent view is that no such duty exists under the former. What characterises the most recent developments in the field of the regulation of non- or less-lethal weapons is the effort to offer practical guidance as concerns testing, procurement, training and monitoring, on the assumption that, in a law-enforcement situation, the cumulative principles of legality, necessity, proportionality and precaution govern the use of force by State agents.

Keywords Civilians · Conduct of hostilities · Law enforcement · NATO · Non-lethal weapons · Proportionality

1.1 Introduction

Almost two decades have passed since the North Atlantic Treaty Organization NATO and its member States showed a specific interest in the development and employment of non-lethal technologies. The definition of non-lethal weapons (NLW) provided by the 1999 NATO policy has continued to represent a reference point for any critical assessment of them: they were defined 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.”¹

The lively debate that followed the adoption of the NATO policy—animated essentially by a core group of experts with different backgrounds—challenged the impression that such a category could constitute a fundamentally distinct category of weapons under international humanitarian law (IHL).² Irrespective of any promises of sparing human lives, existing rules and principles of IHL apply to emerging non-lethal technologies, whether anti-personnel or anti-materiel: under Article 36 of Additional Protocol I, States are under a duty to conduct legal reviews of new weapons in order to determine if their employment “would, in some or all circumstances, be prohibited”.³

Yet, scholars have questioned the analytical value of the concept of “non-lethal” itself:⁴ the reference to “low probability of fatality” does not seem to constitute a decisive criterion in drawing a clear line between “lethal” and “non-lethal”, given that the danger of fatal injury remains for the use of most weapons.⁵ Even the term

¹ NATO 1999.

² See, *inter alia*, Boothby 2016, p. 216.

³ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), opened for signature 8 June 1977, 1125 UNTS 3 (entered into force 7 December 1978) (AP I), Article 36.

⁴ Fidler 1999, p. 97.

⁵ See Casey-Maslen 2010, p. 9.

“incapacitation” appears to be misleading, for example in the context of the toxic chemicals known as incapacitating agents.

This contributes to explaining—at least partially—the reason why the notion of “less lethal weapons” increasingly emerged, particularly in academic circles. Although there is no agreed meaning in international law, an accepted working definition for law enforcement purposes is based on a comparison with firearms, as weapons having “a lower risk of causing death or serious injury”.⁶ It remains that the current debate on the regulation of autonomous weapons systems (AWS) has been characterised by the dichotomy lethal/non-lethal, particularly as regards the question whether there exists a specific duty to build AWS only in such a way that they are unable to kill human beings.⁷

In the last twenty years, several attempts have been made to offer a comprehensive taxonomy of NLW, by referring to both the specific technology they employ as well as the effects on personnel and equipment. Several categories of existing and programmed technologies have been identified by NATO: acoustic systems, such as flash bang and acoustic hand grenades, loud speaker arrays, and underwater acoustic devices; chemical agents, including tear gas, malodorant, pepper spray, and irritants deployed using various means; electromagnetic weapons, comprising optical warning devices, electro-muscular incapacitation, radio frequency vehicle or vessel stopping, disruptive high-power microwaves; mechanical/kinetic devices, such as munitions with blunt impact effects and various counter vehicle nets and barriers.⁸

⁶ See Geneva Academy of International Humanitarian Law and Human Rights (2018). See also Institute for Non-Lethal Defense Technologies 2004, p. 182: “technologies, weapons and tactics, which are less likely to result in death or serious injury than conventional firearms”.

⁷ See the discussion during the 2018 session of the Group of Governmental Experts on emerging technologies in the area of lethal autonomous weapons systems (LAWS), as to the characterisation of this category: whereas

some delegations felt that lethality was an essential characteristic, [...] several delegations expressed the view that a focus on lethality would fail to address injuries to persons or damage to objects that are protected by IHL, [...] while others felt that the term ‘lethal’ as a characteristic needed to be further examined in the light of the fundamental notion of use of force, which triggers legal obligations under international law irrespective of lethality.

Group of Governmental Experts of the High Contracting Parties 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 (2018) Report of the 2018 session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, UN Doc. CCW/GGE.1/2018/3, p. 12.

⁸ Cf. NATO 2009. For a discussion of the relevant non-lethal technologies, see Dahl 2012, pp. 218–228.

1.2 The Persistent Need for Non-Lethal Technologies

There is no doubt that innovations in science and technology have been a driving factor in the development of NLW. It has also become obvious that the context for military activity has evolved in the last decades. In its 1999 policy paper, the NATO Council identified NLW as a “critical, additional capability needed in order to meet the demands of future operations”.⁹

As the world urbanises, hostilities are increasingly taking place in densely populated areas, including city centres.¹⁰ In recent years, the acquisition of NLW has been regarded as a valuable option to protect the civilian population, as required by the rule of proportionality and the obligation to take all feasible precautions under IHL.¹¹ In Afghanistan the International Security Assistance Force (ISAF), led by NATO, implemented policy changes for its counterinsurgency activities, in order to minimise civilian casualties, recognising that such harm could lead to the loss of support for the mission, undermine longer-term political objectives and, ultimately, affect mission success.¹² In particular, a 2011 report for the ISAF Commander recommended “a “deep dive” to identify non-lethal capabilities and options”, as initial data showed a 80–90% reduction in undesired outcomes—including both own force casualties and civilian casualties—when NLW were available.¹³

Still, the starting point of the NATO S&T studies¹⁴ has been the consideration that NLW were successfully used by armed forces not only for the conduct of hostilities, but also in law enforcement activities to maintain or restore public security, law and order:¹⁵ in Bosnia and Kosovo, in the context of peace operations, as well as in counter-piracy activities off the coast of Africa.¹⁶ However, it is important to distinguish between these two scenarios, as different legal paradigms apply with regard to the use of armed force: whereas *jus in bello* allows the use of lethal force against lawful targets in the conduct of hostilities, international human

⁹ NATO 1999.

¹⁰ Bernard 2016, p. 2.

¹¹ See AP I, above n 3, Articles 51(5)(b) and 57; Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), opened for signature 8 June 1977, 1125 UNTS 609 (entered into force 7 December 1978), Article 13. The principles of proportionality and precautions in attack are considered customary in both international and non-international armed conflicts. See Henckaerts and Doswald-Beck 2005, pp. 46–51, Rules 14–15.

¹² Cf., *inter alia*, Muhammedally 2016, p. 232.

¹³ Cf. NATO 2017.

¹⁴ See, already, NATO 2004.

¹⁵ Melzer and Gaggioli 2015, p. 63: “the generic concept of law enforcement comprises all territorial and extraterritorial measures taken by a State or other collective entity to maintain or restore public security, law and order or to otherwise exercise its authority or power over individuals, objects or territory”.

¹⁶ On the use of NLW in maritime operations, see Annati 2014.

rights law (IHRL) protects the right to life during law enforcement activities meaning that lethal armed force may be employed only as a last resort. In the legal assessment of the use of NLW, one should take into account that the principles of necessity, proportionality and precaution operate differently under the two paradigms, although sometimes it may be difficult to draw a clear line between situations governed by the conduct of hostilities framework and those governed by the law enforcement one.¹⁷

The deployment of multidimensional UN peacekeeping operations in hostile environment has offered concrete scenarios in which the distinction between the two legal paradigms risks being problematic: it is also for this reason that the availability of non-lethal technologies has been regarded as a promising development. Not only military and police forces are entrusted with the task of performing law-enforcement-type activities,¹⁸ there is also an increasing pressure on peacekeepers to use force in defence of the mandate, i.e. to protect civilians under attack or under threat of attack and “to protect the peace agreement and process from “spoilers” wishing to undermine it”.¹⁹ The two UN multidimensional integrated stabilisation missions in Mali (MINUSMA) and Central African Republic (MINUSCA) have become the paradigmatic examples of increasingly robust mandates, the tasks of which include, for instance, “to stabili[s]e the key population centres and other areas where civilians are at risk, notably in the North and Centre of Mali, and, in this regard: to enhance early warning, to anticipate, deter and counter threats, including asymmetric threats”.²⁰

It follows that UN peacekeeping operations deployed in asymmetric threat environments are in need of a different set of capabilities.²¹ This led to a rethinking of the training methodologies and the recognition of the need for more effective equipment, particularly in situations of crowd control.²² The Final Report of the Expert Panel on Technology and Innovation in UN Peacekeeping could not but recognise that, in the past, armed peacekeepers were unable to defuse or control violent and dangerous situations, because they were not well equipped with less-than-lethal technologies.²³

As a policy option, NLW could enhance the ability to achieve military tasks in circumstances where the use of lethal force would be either unnecessary or undesired. Other purposes for their development and use have been identified in limiting

¹⁷ ICRC 2011, p. 19.

¹⁸ See, recently, Wills 2018.

¹⁹ White 2014, p. 103.

²⁰ UN Security Council (2018) Resolution 2423 (2018), UN Doc. S/RES/2423, para 38.

²¹ Kalsrud 2017, p. 1221.

²² The 2015 Report of the UN High-level Independent Panel on Peace Operations held that UN peacekeeping operations “lack the specific equipment, intelligence, logistics, capabilities and speciali[s]ed military preparation required, among other aspects”. UN General Assembly/Security Council (2015) Report of the UN High-level Independent Panel on Peace Operations, UN Doc. A/70/95-S/2015/446, para 119. See also Davison 2013, p. 294.

²³ United Nations 2015, p. 76.

or controlling escalation, improving force protection and minimising damage for the purpose of containing post-conflict reconstruction costs.²⁴ Nevertheless, commentators have questioned whether advances in non-lethal technologies are actually able to keep the promise in reducing lethality and destruction of property.²⁵ The point has been made that their employment may either increase the overall use of force or facilitate a shift towards the militarisation of certain responses, including counter-terrorism.²⁶ In the same vein, an attempt to offer a more systematic ethical discourse on non-lethality has been rejected as morally impermissible any use of NLW that sees them as “a method to make war more palatable and easier to use as both a military and political option”.²⁷

1.3 Non-Lethal Weapons as Valuable Alternatives to Firearms Between International Humanitarian Law and International Human Rights Law

The argument that NLW could render war more palatable involves the ethical and legal dilemma as to whether the availability of such technologies might destabilise the foundations of modern *jus ad bellum* by expanding the circumstances in which force could be used under international law. It goes without saying that the decision to employ non-lethal capabilities in a specific scenario still requires an assessment whether this would amount to the use or threat of armed force in international relations. It remains that the legality of a specific operation under *jus ad bellum* is distinct from its legality under *jus in bello*.²⁸

As concerns the compatibility with IHL, legal analysis has first focused on the question whether the development of NLW would generally be limited either by specific treaty prohibitions or by the prohibition not to employ weapons that are of a nature to cause superfluous injury or unnecessary suffering or having excessively injurious or indiscriminate effects.²⁹ There is no doubt that any use of biological and chemical agents as a means or method of warfare is prohibited under the 1972 and 1993 Conventions,³⁰ irrespective of their production method and physical

²⁴ Boothby 2012, p. 273.

²⁵ For the position that the NLW enterprise is worthy of continuation and even expansion to meet more fully its ambitious goals, see Koplou 2015, p. 238.

²⁶ Fidler 2013, pp. 332–334.

²⁷ Kaurin 2014, p. 57.

²⁸ On the relationship between *jus ad bellum* and *jus in bello*, see, *inter alia*, Sassoli 2007.

²⁹ Nystuen 2008, p. 9.

³⁰ Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, opened for signature 10 April 1972, 1015 UNTS 163 (entered into force 26 March 1975); Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on

effects. As concerns another type of NLW, Protocol IV of the 1980 Convention on Certain Conventional Weapons bans laser weapons “specifically designed, as their sole combat function or as one of their combat functions, to cause permanent blindness to unenhanced vision”.³¹

As for other categories of potential NLW, special concern was expressed *vis-à-vis* the way in which a particular type of weapon could be used—i.e. the risk of “misuse”—rather than its inherent characteristics.³² With respect to directed energy weapons, a 2004 NATO report had already warned that “excessive power levels can have serious consequences for human targets”,³³ resulting in a prohibited method of warfare that would cause superfluous injury or unnecessary suffering. More generally, two key issues associated with NLW have been discussed: first, their employment in conjunction with traditional conventional weapons to achieve a lethal effect;³⁴ second, the use of such weapons against the civilian population. As for the principle of distinction, notwithstanding the contrary opinion taken by some authors,³⁵ an indiscriminate use of NLW remains unlawful under IHL, irrespective of the fact that the intention was not to kill but simply to temporarily incapacitate civilians.³⁶ The position of NATO has been clear: although “NLWs can help minimise incidental injuries to civilians and collateral damage to civilian objects in those operations where combatants and non-combatants are mixed”, their existence should not be construed as to lessen the requirements of the principle of distinction.³⁷

In discussing the question whether NLW might offer a valuable alternative to firearms, international lawyers have turned their attention to potential uses to perform tasks governed by IHL, which do not relate to the conduct of the hostilities, such as the guarding of persons deprived of their liberty or tasks related to crowd control and maintaining public order in occupied territories. This also meant a shift of interest towards the international regulation of law enforcement operations during armed conflict: it is noteworthy that the 1990 Basic Principles on the Use of Force and Firearms by Law Enforcement Officials include an explicit reference to

Their Destruction, opened for signature 13 January 1993, 1975 UNTS 45 (entered into force 29 April 1997) (CWC).

³¹ Additional Protocol IV 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, opened for signature 13 October 1995, 1380 UNTS 370 (entered into force 30 July 1998), Article 1. See Carnahan and Robertson 1996.

³² Casey-Maslen 2010, p. 73.

³³ NATO 2004, p. 3-9.

³⁴ Backstrom and Henderson 2012, pp. 500–501.

³⁵ Mayer 2007; Orbons 2010, p. 81.

³⁶ Fidler 1999, p. 84.

³⁷ NATO 2004, p. 5-2. The point has been made that employment of NLW against a group of persons in order to disperse the civilians and to identify the combatants, that are then targeted with conventional weapons, would be problematic from the viewpoint of the principle of distinction. See Davison 2013, pp. 293–294.

“the development and deployment of non-lethal incapacitating weapons”.³⁸ The use of force in law enforcement is also governed by IHRL, so the debate on NLW has also necessitated consideration of the complex relationship between IHL and IHRL.

The position recently taken by the UN Human Rights Committee in General Comment No. 36 on Article 6 of the International Covenant on Civil and Political Rights reflects the shared view that IHRL continues to apply “in situations of armed conflict to which the rules of international humanitarian law are applicable”: “both spheres of law are complementary, not mutually exclusive”.³⁹ In understanding the dynamics of complementary co-application, it has been convincingly maintained that one body of law should provide the initial reference point when approaching the legal regulation of a situation, while the other body of law will then be applied and interpreted in that context.⁴⁰ In situations where a State is able to exercise law enforcement, IHRL should find application in the first place.

A number of case-studies have been reviewed in assessing the interplay between IHL and IHRL: two examples—riots during armed conflicts and (vehicle) checkpoints—seem to suggest the added value of the employment of NLW. During an armed conflict, if a demonstration turns violent, armed forces should in principle apply the law enforcement paradigm: lethal force may only be used as a last resort and if strictly necessary. In the case of a simultaneous presence of rioting civilians and civilians directly participating in hostilities, complicating the distinction, the ICRC suggests “to deal with the entire situation under law enforcement, and apply an escalation of force procedure with respect to all persons posing a threat.”⁴¹ It is in this context that NLW may have an important role to play.

Moreover, the value of non-lethal capabilities has been tested in the concrete situation of a vehicle checkpoint. In this scenario too, it might be hard to decide whether the use of force would be governed by the standards of the law enforcement paradigm or by those of the paradigm of hostilities. In the case of an approaching car failing to slow down, it would be difficult to assess whether the driver is a fighter, a civilian directly participating in hostilities, or a civilian protected against direct attack. It has been convincingly argued that, in case of doubt whether an individual is posing a threat, the standards of IHL and IHRL would lead to the same result.⁴² Both the law enforcement and the hostilities paradigms imply that an escalation of force procedure must be applied. In this context, NLW give armed and police forces more flexible responses, which could entail more time and space to safely assess threats, determine intent, and decide whether to employ lethal force.⁴³

³⁸ United Nations 1990, Principle 3.

³⁹ UN Human Rights Committee (2018) General Comment No. 36 on Article 6 of the International Covenant on Civil and Political Rights, on the Right to Life, UN Doc. CCPR/C/GC/36, para 64.

⁴⁰ Murray 2016, p. 79.

⁴¹ ICRC 2015, p. 36.

⁴² Geiss and Siegrist 2011, pp. 42–43.

⁴³ Cf. NATO 2017.

1.4 Prohibited Non-Lethal Weapons

In explaining that the whole distinction is more apparent than real (and definitely not relevant from a legal viewpoint), the point has been made that lethal weapons are frequently non-lethal in their practical effects—considering “the high percentage of wounded combatants who survive injuries caused by such weapons”⁴⁴—whereas non-lethal weapons do not eliminate the possibility of causing fatalities altogether. Even though the ICRC has found that “military manuals and official statements state that weapons that render death inevitable are prohibited”,⁴⁵ non-lethality, in and of itself, is not a criterion that ensures lawfulness. On the basis of the absolute prohibitions contained in the relevant treaties, one can easily conclude that the use of both biological and chemical agents⁴⁶ as well as incapacitating anti-personnel mines, blinding laser weapons and non-detectable fragments are forbidden as means and methods of warfare, irrespective of their lethal or non-lethal nature.

Where the regulatory approach based on the application of the general principles of the law of armed conflict is concerned, views differ as to how it can actually be determined whether a weapon falls within one of the prohibited categories: those causing superfluous injury or unnecessary suffering, those intended or that may be expected “to cause widespread, long-term and severe damage to the natural environment”,⁴⁷ or those that are by nature indiscriminate. As for the prohibition of superfluous injury or unnecessary suffering, the test is whether a proportionate balance exists between the effects of a specific weapon and its military advantage.⁴⁸ This requires assessing the foreseeable, immediate and long-term consequences. In the view of the ICRC, a relevant factor in establishing whether a weapon is of a nature to cause superfluous injury or unnecessary suffering is the “inevitability of serious permanent disability”.⁴⁹ It is still debated to what extent the analogy with the prohibition on blinding as a method of warfare could be extended to the permanent deafness caused by the use of certain acoustic weapons. In this regard, IHRL could offer additional criteria for the evaluation of a weapon’s effect.⁵⁰

⁴⁴ Dinstein 2016, p. 65.

⁴⁵ Henckaerts and Doswald-Beck 2005, p. 241. However, see Dinstein 2016, p. 65, who has argued that “the employment of weapons that leave no chance of survival (such as fuel air explosives) is not automatically in breach of the cardinal principle”.

⁴⁶ One might question whether malodorants fall within the definition of toxic chemicals under the 1993 CWC, above n 30. It has been argued that they should be considered as falling within the category of riot control agents, at least in terms of their regulation. Cf. Crowley 2016.

⁴⁷ AP I, above n 3, Article 35(3). Moreover, cf. Henckaerts and Doswald-Beck 2005, p. 151, Rule 45. For the present purposes it is not relevant to enter into the discussion over the customary nature of the prohibition.

⁴⁸ Cf. Bothe et al. 1982, p. 196.

⁴⁹ Henckaerts and Doswald-Beck 2005, p. 241.

⁵⁰ Murray 2016, p. 166.

In recent years, more emphasis has been given to human rights standards in determining whether the inherent character of a specific weapon would make it unlawful both in law enforcement and hostilities scenarios. More specifically, the obligation to prevent human rights violations—including an arbitrary deprivation of life or an infliction of torture or other cruel, inhuman or degrading treatment—implies that States are under a duty to test NLW for law enforcement purposes in order “to establish their lethality and the extent of likely injury, and of monitoring appropriate training and use of such weapons”.⁵¹

A list of unlawful weapons, insofar as they are “specifically designed or of a nature [...] to: (a) employ unnecessary, excessive or otherwise unlawful force against persons; or (b) to inflict pain and suffering on powerless individuals”,⁵² comprises body-worn conducted electrical weapons,⁵³ spiked or electrified batons, rubber-coated metal bullets and lasers designed to burn skin or hair as a means of pain compliance.⁵⁴

1.5 Prohibited as a Means or Method of Warfare but Permitted for Law Enforcement: Riot Control Agents

The ban on a specific weapon as a means or method of warfare should not be necessarily construed in absolute terms, in the sense that it does not exclude its possible lawful use in other situations. Riot-control agents (RCA), together with expanding bullets, belong to the restricted category of weapons that, although prohibited for the conduct of hostilities, are used for law enforcement purposes.⁵⁵

Under Article I(5) of the 1993 Convention on Chemical Weapons (CWC), States Parties undertake “not to use riot control agents as a method of warfare”, whereas Article II(9)(d) permits the use of chemicals for “law enforcement including domestic riot control purposes.”⁵⁶ The recourse to RCA against combatants during

⁵¹ UN General Assembly (2014) Human Rights Council: Resolution 25/38. The promotion and protection of human rights in the context of peaceful protests, UN Doc. A/HRC/RES/25/38, para 15.

⁵² UN General Assembly (2017) Human Rights Council: Report of the Special Rapporteur on torture and other cruel, inhuman or degrading treatment or punishment: Extra-custodial use of force and the prohibition of torture and other cruel, inhuman or degrading treatment or punishment, UN Doc. A/72/178, para 51.

⁵³ Amnesty International and Omega Research Foundation 2015, p. 24. See also European Council Regulation (EC) No. 1236/2005 of 27 June 2005 concerning trade in certain goods which could be used for capital punishment, torture or other cruel, inhuman or degrading treatment or punishment, I OJ L 200/1.

⁵⁴ Geneva Academy of International Humanitarian Law and Human Rights 2018, p. 19.

⁵⁵ See Watkin 2006.

⁵⁶ CWC, above n 30, Articles I(5), II(9)(d).

an armed conflict is prohibited, for two essential reasons: to prevent their use in combination with conventional weapons, for instance as a method of cave combat, and to avoid the risk of escalation to an exchange of lethal chemical agents.⁵⁷ On the other hand, the use of such chemicals for law enforcement is not limited to domestic riot control: the Convention allows States to employ them for the maintenance of public order and safety in situations of belligerent occupation and in the course of peace operations, provided that “types and quantities” are consistent with such purpose.⁵⁸ One of the aspects that remain ambiguous under the CWC is the determination of the specific features that delivery systems should have to allow the dissemination of appropriate “types and quantities” of RCA: the European Court of Human Rights has noted that the use of a particular RCA in high doses “can cause necrosis of the tissue in the respiratory tract and the digestive system, pulmonary oedema and internal bleeding (haemorrhaging of the suprarenal glands)”.⁵⁹ Of particular concern is the development of “remote control” means of delivery including indoor fixed-installation dispersion devices as well as mechanisms mounted on unmanned ground vehicles and unmanned aerial vehicles or drones.

The other main interpretative issue is whether state officials are allowed to use other chemical agents, apart from riot control agents, in certain law enforcement scenarios (for instance in hijacking and hostage taking situations). The potential use of incapacitating chemical agents (ICA)—toxic chemicals that target the central nervous system—have been discussed by experts in numerous forums.⁶⁰ There is agreement that such chemicals in principle do not possess the qualitative and quantitative characteristics for their employment in “law enforcement”.⁶¹ In particular States are not able to ensure adequate control over the individual dosage and the exposure

⁵⁷ Longuet 2016, p. 250; Marauhn 2016.

⁵⁸ Sossai 2010, p. 20. For the position that RCA reliance by UN forces would be potentially illegal, see Fry 2010. A 2004 amendment to Germany’s Law Implementing the Chemical Weapons Convention allows the use of RCAs “by the Federal Armed Forces in deployments within the framework of a system of mutual collective security”. See ICRC 2019.

⁵⁹ ECtHR, *Abdullah Yaşa and Others v Turkey*, Judgement, 16 July 2013, Application No. 44827/08, para 30. Moreover, the Court distinguished between the use of RCA and the launching of a tear-gas grenade at the demonstrators, by stressing that “firing a grenade by means of a launcher generates the risk of causing serious injury, as in the instant case, or indeed of killing someone, if the grenade launcher is used improperly”. Ibid., para 42. In addition, see ECtHR, *Ataykaya v Turkey*, Judgement, 22 July 2014, Application No. 50275/08, para 73:

The Court notes that the violation of the right to life of the applicant’s son, as guaranteed by Article 2 of the Convention, originates once again in a problem stemming from the absence of guarantees as to the proper use of tear-gas grenades. Consequently, the Court emphasises the need to strengthen those guarantees, without delay, in order to minimise the risks of death and injury related to the use of tear-gas grenades.

⁶⁰ See, e.g., ICRC 2013a.

⁶¹ Cf. Crowley 2016.

conditions, as required also by the relevant obligations under IHRL.⁶² Various States Parties too have expressed their concern that ICAs pose a serious challenge to the CWC: “[g]iven the difficulties associated with uniformly disseminating these agents outside of a clinical setting, it is extremely challenging (if not impossible) to control an aerosolised dose received by an individual (or group of people).”⁶³

1.6 On the Duty to Review and Regulate Non-Lethal Weapons

Recognising that IHL does not address NLW as a specific category of weapons, they should be subjected to legal review, like all other new weapons, means, and methods of warfare. Article 36 of Additional Protocol I requires contracting parties to ensure a domestic assessment mechanism⁶⁴ to determine whether a new weapon complies with any rule of international law that is applicable to a particular state. This requires the involvement of experts belonging to various disciplines, and an examination of “all relevant empirical information pertaining to the weapon, such as its technical description and actual performance, and its effects on health and the environment”.⁶⁵

It has been argued that all weapons, irrespective of the purpose and the context in which they are used, should be explicitly adjudged under both IHL and IHRL, which reinforce each other in most cases.⁶⁶ An obligation to carefully evaluate “the development and deployment of non-lethal incapacitating weapons [...] in order to minimise the risk of endangering uninvolved persons” has been already contained in the Basic Principles on the Use of Force and Firearms by Law Enforcement

⁶² The ICRC has expressed criticism with respect to the conclusions reached in ECtHR, *Finogenov and others v Russia*, Judgement, 20 December 2011, Applications Nos. 18299/03 and 27311/03: in relation to the use of Fentanyl by the Russian special forces during the Moscow theatre siege incident of 2002,

the Court was not provided information about the specific toxic chemicals used and thus was in a difficult position to judge whether the adverse effects of their use should have been foreseen. The dangerous effects of anaesthetic and sedative chemicals are well known, and were illustrated by the deaths of 129 hostages in this incident and permanent disabilities suffered by survivors. In addition, it is evident that the ‘dose’ of a chemical delivered cannot be controlled in such a tactical situation and that it is extremely difficult, if not impossible, in such situations to provide the immediate medical care that might be characterised as adequate to protect life.

ICRC 2013a, p. 155.

⁶³ OPCW (2017) Joint Paper Aerosolisation of Central Nervous System-Acting Chemicals for Law Enforcement Purposes, Doc. C-22/NAT.5.

⁶⁴ See Daoust et al. 2002.

⁶⁵ ICRC 2006.

⁶⁶ Casey-Maslen et al. 2014, p. 412.

Officials.⁶⁷ Assuming that States are under an obligation to take all appropriate measures—of legislative, administrative, judicial or other character—to prevent the employment of a weapon in violation of IHRL, it has been argued that this entails a specific duty to regulate and review the development, acquisition, trade and use of weapons.⁶⁸

The existence of a specific duty to regulate and review less-lethal weapons has been affirmed by the UN Human Rights Committee in regard to the right to life. Strict independent testing is considered as implementing the obligation to “evaluate and monitor the impact on the right to life of weapons [...], which are designed for use or are actually used by law enforcement officials, including soldiers charged with law enforcement missions”. The Committee has further clarified that “[t]he use of such weapons must be restricted to law enforcement officials who have undergone appropriate training, and must be strictly regulated in accordance with applicable international standards”.⁶⁹

Moreover, the importance of “thorough and independent testing of less-lethal weapons prior to procurement and deployment to establish their lethality and the extent of likely injury, and of monitoring appropriate training and use of such weapons” has been recently reiterated by the UN Human Rights Council.⁷⁰ What characterises the most recent developments in the field of the regulation of non- or less-lethal weapons is the effort to offer practical guidance as concerns testing, procurement training and monitoring, on the assumption that, in a law enforcement situation, the cumulative principles of legality, necessity, proportionality and precaution govern the use of force by State agents.⁷¹ Therefore, testing comprises an evaluation of the effects of all anticipated uses through a multidisciplinary approach, which, in particular, includes an assessment of the potential consequences on vulnerable groups.⁷² Concern has been raised over the infliction of pain or suffering, as a form of punishment or as a means of coercing the targeted persons, associated with the use of conducted electrical weapons, including tasers, which

⁶⁷ United Nations 1990, Principle 3.

⁶⁸ UN General Assembly (2017) Human Rights Council: Report of the Special Rapporteur on torture and other cruel, inhuman or degrading treatment or punishment: Extra-custodial use of force and the prohibition of torture and other cruel, inhuman or degrading treatment or punishment, UN Doc. A/72/178, p. 20.

⁶⁹ UN Human Rights Committee (2018) General Comment No. 36 on Article 6 of the International Covenant on Civil and Political Rights, on the right to life, UN Doc. CCPR/C/GC/36, para 14. In addition, see Casey-Maslen and Connolly 2017, p. 156.

⁷⁰ UN General Assembly (2018) Human Rights Council: Resolution 38/11 The promotion and protection of human rights in the context of peaceful protests, UN Doc. A/HRC/RES/38/11, para 16.

⁷¹ UN General Assembly (2014) Human Rights Council: Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, UN Doc. A/HRC/26/36.

⁷² Geneva Academy of International Humanitarian Law and Human Rights 2018, p. 15.

could amount to cruel, inhuman or degrading treatment. Other NLW—including irritant chemicals and acoustic weapons and equipment—might pose a particular risk to the principle of distinction and proportionality because of their indiscriminate effects in certain circumstances, for instance when they are used for maintaining public order during assemblies and demonstrations, because of the difficulties in distinguishing between the targeted individuals and the crowd.

1.7 Concluding Remarks on the Existence of a Duty to Employ Non-Lethal Weapons

The regulatory approach based on a combination of explicit prohibitions and general criteria prohibiting means and methods of warfare causing unlawful consequences seems to reflect the idea of the reactive character of IHL *vis-à-vis* new weapons, with few exceptions. It is a feature of this branch of international law, which has been criticised for its lack of proactive perspective. Lawyers too—according to this line of reasoning—appear more interested in limiting new technology rather than participating in the development of new ones, including technology with non-lethal capabilities.⁷³ This position appears too severe, as it does not take into consideration the broad temporal application of Article 36 of Additional Protocol I, which requires an assessment of the legality of new weapons at the stages of their “study, development, acquisition or adoption”: it means that it covers all stages of the weapons procurement process, including the initial stages of research (i.e. conception, study) and development (i.e. development and testing of prototypes).⁷⁴

The content of the second basic principle of the 1990 Basic Principles on the Use of Force and Firearms by Law Enforcement Officials has been regarded as a sort of “unqualified endorsement” for NLW, since it invites governments and law enforcement agencies to develop “non-lethal incapacitating weapons for use in appropriate situations, with a view to increasingly restraining the application of means capable of causing death or injury to persons”.⁷⁵ The existence of a specific duty to equip law-enforcement officials with self-defensive equipment as well as less-than-lethal weapons is also an expression of the requirements of necessity,

⁷³ See Megret 2008, p. 46.

⁷⁴ ICRC 2006, p. 951.

⁷⁵ United Nations 1990, Principle 2.

precaution⁷⁶ and proportionality in the use of force, which derive from the protection of the right to life.⁷⁷

By way of conclusion, it is important to briefly discuss whether States are obliged to employ non-lethal capabilities, before the use of lethal force, in the course of an armed conflict.⁷⁸ The position of the NATO policy is clearly in the negative:

Neither 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. In all cases NATO forces shall retain the option for immediate use of lethal weapons consistent with applicable national and international law and approved Rules of Engagement.⁷⁹

Although it has been predicted that “in the future NLWs would indeed raise the threshold for use of lethal force”,⁸⁰ a fundamental distinction between the conduct of hostilities paradigm and law enforcement remains that the former “does not suppose the use, if possible, of less-than-lethal weapons”.⁸¹ The issue has been raised again with respect to the potential existence of an obligation to deploy combat robots only as non-lethal systems:⁸² however, in order to support that view, it would be necessary to accept the still controversial position according to which IHL has already evolved—driven by both the principles of military necessity and humanity—to the extent that even in armed conflict lethal force should be used only if no other less harmful alternative is available.⁸³

⁷⁶ Cf. ECtHR, *McCann and Others v The United Kingdom*, Grand Chamber Judgement, 27 September 1995, Application No. 18984/91, para 194.

⁷⁷ See UN Human Rights Committee (2018) General Comment No. 36 on Article 6 of the International Covenant on Civil and Political Rights, on the right to life, UN Doc. CCPR/C/GC/36, para 13: among the measures intended to prevent arbitrary deprivations of life, the Committee mentions, “supplying of forces responsible for crowd control with effective ‘less-lethal’ means and adequate protective equipment in order to obviate their need to resort to lethal force”. Moreover, see UN General Assembly (2016) Human Rights Council: Joint Report of the Special Rapporteur on the rights to freedom of peaceful assembly and of association and the Special Rapporteur on extrajudicial, summary or arbitrary executions on the proper management of assemblies, UN Doc. A/HRC/31/66, para 54.

⁷⁸ Cf. Boothby 2016, p. 237.

⁷⁹ NATO 1999. See Massingham 2012, p. 683.

⁸⁰ See the comments by David Koplow, quoted in Davison and Lewer 2005, p. 27.

⁸¹ ICRC 2013b, p. iv.

⁸² Geiss 2015, p. 19.

⁸³ Melzer 2009, p. 78; Goodman 2013. *Contra*, Schmitt 2013. Moreover, see UN Human Rights Committee (2018) General Comment No. 36 on Article 6 of the International Covenant on Civil and Political Rights, on the right to life, UN Doc. CCPR/C/GC/36, para 64: “States parties should, in general, disclose the criteria for attacking with lethal force individuals or objects whose targeting is expected to result in deprivation of life, including [...] whether less harmful alternatives were considered”. It is noteworthy that the text adopted by the Committee on the first reading contained a reference to the notion of “non-lethal”: “whether non-lethal alternatives for attaining the same military objective were considered”.

References

Articles, Books and Other Documents

- Amnesty International, Omega Research Foundation (2015) The human rights impact of less lethal weapons and other law enforcement equipment. <https://www.amnesty.org/download/Documents/ACT3013052015ENGLISH.PDF>. Accessed 29 October 2018
- Annati M (2014) The Role of Non-Lethal Weapons in Maritime Operations. *NATO-NMIOTC Maritime Interdiction Operations Journal* 9:38–41
- Backstrom A, Henderson I (2012) New capabilities in warfare: An overview of contemporary technological developments and the associated legal and engineering issues in Article 36 weapons reviews. *International Review of the Red Cross* 94(886):483–514
- Bernard V (2016) War in Cities: The spectre of total war. *International Review of the Red Cross* 98:1–11
- Boothby WH (2012) *The Law of Targeting*. Oxford University Press, Oxford
- Boothby WH (2016) *Weapons and the Law of Armed Conflicts*. Oxford University Press, Oxford
- Bothe M, Partsch KJ, Solf WA (1982) *New Rules for Victims of Armed Conflict: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*. Martinus Nijhoff Publishers, Leiden/Boston
- Carnahan B, Robertson M (1996) The Protocol On “Blinding Laser Weapons”: A New Direction for International Humanitarian Law. *American Journal of International Law* 90:484–490
- Casey-Maslen S (2010) Non-kinetic energy weapons termed ‘non-lethal’: A Preliminary Assessment under International Humanitarian Law and International Human Rights Law. Geneva Academy of International Humanitarian Law and Human Rights, Geneva. <https://www.geneva-academy.ch/joomlatools-files/docman-files/Non-Kinetic-Energy%20Weapons.pdf>. Accessed 29 October 2018
- Casey-Maslen S, Connolly S (2017) *Police Use of Force under International Law*. Cambridge University Press, Cambridge
- Casey-Maslen S, Corney N, Dymond-Bass A (2014) The review of weapons under international humanitarian law and human rights law. In: Casey-Maslen S (ed) *Weapons under International Human Rights Law*. Cambridge University Press, Cambridge, pp. 411–447
- Crowley M (2016) *Chemical Control: Regulation of Incapacitating Chemical Agent Weapons, Riot Control Agents and their Means of Delivery*. Palgrave, Basingstoke
- Dahl AW (2012) New Technologies in Counter-Terrorism and Counter-Insurgency Operations. *Israel Yearbook on Human Rights* 42:215–230
- Daoust I, Coupland R, Ishoey R (2002) New wars, new weapons? The obligation of states to assess the legality of means and methods of warfare. *International Review of the Red Cross* 84:345–363
- Davison N (2013) *New Weapons: Legal and Policy Issues Associated with Weapons Described as ‘Non-Lethal’*. In: Saxon D (ed) *International Humanitarian Law and the Changing Technology of War*. Martinus Nijhoff Publishers, Leiden/Boston, pp. 281–313
- Davison N, Lewer N (2005) *Bradford Non-Lethal Weapons Research Project (BNLWRP)*. Research Report No. 7. University of Bradford, Department of Peace Studies, Centre for Conflict Resolution. https://bradscholars.brad.ac.uk/bitstream/handle/10454/3999/BNLWRPResearchReportNo7_May05.pdf?sequence=1&isAllowed=y. Accessed 11 April 2019
- Dinstein Y (2016) *The Conduct of Hostilities Under the Law of International Armed Conflict*, 3rd edn. Cambridge University Press, Cambridge
- European Council Regulation (EC) No. 1236/2005 of 27 June 2005 concerning trade in certain goods which could be used for capital punishment, torture or other cruel, inhuman or degrading treatment or punishment, I OJ L 200/1

- Fidler DP (1999) The International Legal Implications of “Non-Lethal” Weapons. *Michigan Journal of International Law* 21:51–100
- Fidler DP (2013) The Path to Less Lethal and Destructive War? In: Saxon D (ed) *International Humanitarian Law and the Changing Technology of War*. Martinus Nijhoff Publishers, Leiden/Boston, pp. 315–336
- Fry JD (2010) Gas Smells Awful: U.N. Forces, Riot-Control Agents, and the Chemical Weapons Convention. *Michigan Journal of International Law* 31:475–558
- Geiss R, Siegrist M (2011) Has the armed conflict in Afghanistan affected the rules on the conduct of hostilities? *International Review of the Red Cross* 93(881):11–46
- Geiss R (2015) The International-Law Dimension of Autonomous Weapons Systems. Documentation. Friedrich Ebert Stiftung. <http://library.fes.de/pdf-files/id/ipa/11673.pdf>. Accessed 29 October 2018
- Geneva Academy of International Humanitarian Law and Human Rights (2018) Geneva Guidelines on Less-Lethal Weapons and Related Equipment for Law Enforcement. <https://www.geneva-academy.ch/joomlatools-files/docman-files/Geneva%20Guidelines%20on%20Less-Lethal%20Weapons%20and%20Related%20Equipment%20in%20Law%20Enforcement.pdf>. Accessed 29 October 2018
- Goodman R (2013) The Power to Kill or Capture Enemy Combatants. *European Journal of International Law* 24:819–853
- Group of Governmental Experts of the High Contracting Parties 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 (2018) Report of the 2018 session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, UN Doc. CCW/GGE.1/2018/3
- Henckaerts JM, Doswald-Beck L (2005) *Customary International Humanitarian Law, Volume I: Rules*. Cambridge University Press, Cambridge
- ICRC (2006) A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977. *International Review of the Red Cross*. 88(864):931–956
- ICRC (2011) International Humanitarian Law and the challenges of contemporary armed conflicts. <https://www.icrc.org/en/doc/assets/files/red-cross-crescent-movement/31st-international-conference/31-int-conference-ihl-challenges-report-11-5-1-2-en.pdf>. Accessed 29 October 2018
- ICRC (2013a) “Incapacitating chemical agents”: Law enforcement, human rights law and policy perspectives. Expert Meeting. <https://www.icrc.org/eng/assets/files/publications/icrc-002-4121.pdf>. Accessed 29 October 2018
- ICRC (2013b) The Use of Force in Armed Conflicts: Interplay Between the Conduct of Hostilities and Law Enforcement Paradigms. Expert Meeting. <https://www.icrc.org/eng/assets/files/publications/icrc-002-4171.pdf>. Accessed 29 October 2018
- ICRC (2015) International humanitarian law and the challenges of contemporary armed conflicts. <https://www.icrc.org/en/download/file/15061/32ic-report-on-ihl-and-challenges-of-armed-conflicts.pdf>. Accessed 29 October 2018
- ICRC (2019) Germany: Practice Relating to Rule 75. Riot Control Agents. ICRC IHL Database. https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_cou_de_uhl_rule75. Accessed 1 May 2019
- Institute for Non-Lethal Defense Technologies (2004) Report on the Third International Law Enforcement Forum: Minimal Force Options and Less-Lethal Technologies. Institute for Non-Lethal Defense Technologies, Applied Research Laboratory of the Pennsylvania State University. <https://www.ncjrs.gov/pdffiles1/nij/grants/232752.pdf>. Accessed 1 May 2019
- Karlsrud J (2017) Towards UN counter-terrorism operations? *Third World Quarterly* 38:1215–1231
- Kaurin P (2014) *The Warrior, Military Ethics and Contemporary Warfare: Achilles Goes Asymmetrical*. Ashgate, Farnham

- Koplow DA (2015) Red-Teaming NLW: A Top Ten List of Criticisms About Non-Lethal Weapons. *Case Western Reserve Journal of International Law* 47:229–238
- Longuet S (2016) Permitted for law enforcement purposes but prohibited in the conduct of hostilities: The case of riot control agents and expanding bullets. *International Review of the Red Cross* 98(901):249–274
- Marauhn T (2016) Chemical Weapons and Warfare. In: *Max Planck Encyclopedia of Public International Law*
- Massingham E (2012) Conflict without casualties... a note of caution: non-lethal weapons and international humanitarian law. *International Review of the Red Cross* 94(886):673–685
- Mayer C (2007) Nonlethal Weapons and Non-Combatant Immunity: Is it Permissible to Target Noncombatants? *Journal of Military Ethics* 6:221–231
- Megret F (2008) Non-Lethal Weapons and the Possibility of Radical New Horizons for the Laws of War: Why Kill, Wound and Hurt (Combatants) at All? <https://ssrn.com/abstract=1295348>. Accessed 29 October 2018
- Melzer N (2009) *Interpretive Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law*. ICRC, Geneva
- Melzer N, Gaggioli G (2015) Conceptual distinction and overlaps between law enforcement and the conduct of hostilities. In: Gill TD, Fleck D (eds) *The Handbook of the International Law Military Operations*, 2nd edn. Oxford University Press, Oxford, pp. 63–92
- Muhammedally S (2016) Minimizing civilian harm in populated areas: Lessons from examining ISAF and AMISOM policies. *International Review of the Red Cross* 98(901):225–248
- Murray DP (2016) *Practitioner’s Guide to Human Rights Law in Armed Conflict*. Oxford University Press, Oxford
- NATO (1999) Policy on non-lethal weapons. https://www.nato.int/cps/ic/natohq/official_texts_27417.htm?selectedLocale=en. Accessed 29 October 2018
- NATO (2004) Non-Lethal Weapons and Future Peace Enforcement Operations. [https://www.sto.nato.int/publications/STO%20Technical%20Reports/RTO-TR-SAS-040/TR-SAS-040-\\$\\$ALL.pdf](https://www.sto.nato.int/publications/STO%20Technical%20Reports/RTO-TR-SAS-040/TR-SAS-040-$$ALL.pdf). Accessed 11 April 2019
- NATO (2009) Non-Lethal Weapons Effectiveness Assessment Development and Verification Study. [https://www.sto.nato.int/publications/STO%20Technical%20Reports/RTO-TR-SAS-060/\\$\\$TR-SAS-060-ALL.pdf](https://www.sto.nato.int/publications/STO%20Technical%20Reports/RTO-TR-SAS-060/$$TR-SAS-060-ALL.pdf). Accessed 11 April 2019
- NATO (2017) Analytical Support to the Development and Experimentation of NLW Concepts of Operation and Employment. TO Technical Report, Doc. STO-TR-SAS-094
- Nystuen G (2008) Non-lethal weapons and international humanitarian law. <http://www.legal-tools.org/doc/80f124/pdf>. Accessed 11 April 2019
- OPCW (2017) Joint Paper Aerosolisation of Central Nervous System-Acting Chemicals for Law Enforcement Purposes, Doc. C-22/NAT.5
- Orbons S (2010) Do Non-Lethal Capabilities License to ‘Silence’? *Journal of Military Ethics* 9:78–89
- Sassoli M (2007) *Ius ad Bellum and Ius in Bello—The Separation between the Legality of the Use of Force and Humanitarian Rules to be Respected in Warfare: Crucial or Outdated?* In: Schmitt M, Pejic J (eds) *International Law and Armed Conflict: Exploring the Faultlines, Essays in Honour of Yoram Dinstein*. Martinus Nijhoff, Leiden/Boston, pp. 242–264
- Schmitt M (2013) Wound, Capture, or Kill: A Reply to Ryan Goodman’s ‘The Power to Kill or Capture Enemy Combatants’. *European Journal of International Law* 24:855–861
- Sossai M (2010) Drugs as Weapons: Disarmament Treaties Facing the Advances in Biochemistry and Non-Lethal Weapons Technology. *Journal of Conflict and Security Law* 15:5–24
- UN General Assembly (2014) Human Rights Council: Resolution 25/38, The promotion and protection of human rights in the context of peaceful protests, UN Doc. A/HRC/RES/25/38
- UN General Assembly (2014) Human Rights Council: Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, UN Doc. A/HRC/26/36