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Regulation-Tolerant Weapons, Regulation-Resistant Weapons and the Law of War

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The objection that a warlike device is barbarous has always been made against new weapons, which have nevertheless eventually been adopted.

Captain Alfred Mahan, USN¹

I. INTRODUCTION

Historical attempts to regulate weapons through the law of war include examples of both relative success and spectacular failure. Some attempts at weapons regulation have succeeded quite easily, with swift, widespread and enduring agreement followed by reasonably steadfast implementation. Other

1. JAMES BROWN SCOTT, THE PROCEEDINGS OF THE HAGUE PEACE CONFERENCES: THE CONFERENCE OF 1899, at 366 (1920). Captain Mahan served as a lecturer at and later as president of the U.S. Naval War College.

attempts, even with respect to apparently similar technologies, have failed despite persistent and well-resourced campaigns. Still other endeavors have managed to attract initial agreement, but later proved wholly inadequate in the demanding conditions of armed conflict. This mixed record begs explanation. Yet even with the benefit of extensive records of State practice and relatively complete archives of diplomatic proceedings, no theory currently accounts for how weapons law develops under the law of war. This article develops a deepened understanding of the processes and forces that have historically formed weapons law with a view to improving predictions of future advances in this critical area of conflict regulation.

In general, the law of war regulates emerging technologies and existing weapons in two ways. Primarily, States have resorted to generally applicable principles and limitations to regulate weapon technology and use. These principles have crystallized through evolutions in custom, comprised of prolonged State practice and periodic, though increasingly rare, expressions of *opinio juris*.² Many of these principles are now codified in treaties. They also find form in increasingly fine-tuned military legal doctrine applicable to weapons.³ This article begins by identifying the law of war principles most relevant to weapons law and presenting the historical record of their refinement and implementation by States. While law of war principles have proved enduring and flexible guides to the lawfulness of weapons, their ambiguity and abstract content will be shown in Part II to have greatly limited their regulatory effect, as well as their predictive value for advances in weapons law.

In addition to principles, States have employed rules to either ban or limit the use, possession, production and transfer of very specific technologies of war. As with law of war principles, rules for specific weapons take the form of either treaty or custom. And like principles, specific regulations are found in military legal and tactical doctrine. However, rather than regulate generally, rules address themselves to specific weapons or, at most, families of weapons. Their formation generally involves far more deliberate and careful attention on the part of States. This article catalogs a wide range of efforts by States, international organizations, and non-

2. See generally Michael N. Schmitt & Sean Watts, *The Decline of International Humanitarian Law Opinio Juris and the Law of Cyber Warfare*, 50 TEXAS INTERNATIONAL LAW JOURNAL 189 (2015).

3. See, e.g., THE JUDGE ADVOCATE GENERAL'S SCHOOL, U.S. ARMY, OPERATIONAL LAW HANDBOOK 11–15 (2014) [hereinafter U.S. ARMY OPLAW HANDBOOK] (providing U.S. military lawyers instructions on the operation of five law of war principles).

governmental organizations (NGOs) to regulate weapons by means of specific prohibitions or limitations on use. Particular attention is paid to points of disagreement at weapons conferences and concerns that have prevented States from accepting weapons law proposals. Part III reveals a highly diverse experience, with sporadic and what may seem at times capricious enthusiasm for specific regulations on the part of States.

This article concludes with an effort to distill from the preceding historical records, a deeper understanding of how weapons law forms under the law of war. Part IV suggests that a number of qualities of weapon technologies themselves contribute in great part to the prospects of regulatory success or failure. Careful examination of the historical record reveals the existence of both regulation-tolerant weapons and regulation-resistant weapons, identifiable by a number of criteria, including effectiveness, novelty, deployment, medical compatibility, disruptiveness and notoriety. These criteria are presented both to explain and inform existing weapons law, and also to facilitate efforts to identify weapons and emerging technology that may prove susceptible to law of war regulation, as well as technologies that will likely resist regulation.

II. WEAPONS AND LAW OF WAR PRINCIPLES AND GENERAL LIMITATIONS

The principles of the law of war reflect a form of standing consent to international regulation of weapons. All weapons, regardless of their nature or novelty, are subject to each of the principles of the law of war.⁴ No further expression of consent by States is required to apply law of war principles to new weapons. Some of the most widely accepted law of war principles are military necessity, discrimination, proportionality, and humanity or unnecessary suffering.⁵ A fifth principle known alternatively as honor or chivalry is also frequently mentioned. This principle generally prohibits

4. *See* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 86 (July 8) (noting “the newness of nuclear weapons has been expressly rejected as an argument against the application to them of international humanitarian law”). *See also* TALLINN MANUAL ON INTERNATIONAL LAW APPLICABLE TO CYBER WARFARE r. 20, at 75 (Michael N. Schmitt ed., 2013) (concluding that the law of war applies to “cyber operations conducted in the context of an armed conflict”).

5. *See* OFFICE OF THE GENERAL COUNSEL, U.S. DEPARTMENT OF DEFENSE, LAW OF WAR MANUAL §§ 2.1–2.6 (2015) [hereinafter DOD LAW OF WAR MANUAL]; U.S. NAVY, U.S. MARINE CORPS & U.S. COAST GUARD, NWP 1-14M/MCWP 5-12.1/COMDTPUB P5800.7A, THE COMMANDER’S HANDBOOK ON THE LAW OF NAVAL OPERATIONS ¶ 5.3 (2007) [hereinafter NAVY COMMANDER’S HANDBOOK].

conduct and weapons that involve treachery or bad faith deceit in war.⁶ Despite their universal application and near-universal acceptance, recitations of these law of war principles are surprisingly inconsistent with respect to scope and content.⁷ In fact, much of the indeterminacy that accompanies law of war weapons regulation is attributable to the vagueness, abstraction and uncertainty associated with these principles.

The principles of unnecessary suffering, discrimination and honor have been regarded as particularly relevant to weapons law.⁸ Today, application

6. See, e.g., U.S. ARMY OPLAW HANDBOOK, *supra* note 3, at 14–15; OFFICE OF THE JUDGE ADVOCATE GENERAL, CANADA, B-GJ-005-104/FP-021, LAW OF ARMED CONFLICT AT THE OPERATIONAL AND TACTICAL LEVELS ¶ 202.7 (2001) [hereinafter CANADIAN MANUAL]; U.S. DEPARTMENT OF THE ARMY, FM 27-10, THE LAW OF LAND WARFARE ¶ 3 (1956) [hereinafter U.S. ARMY FIELD MANUAL 27-10]. See also MICHAEL BOTHE, KARL JOSEF PARTSCH & WALDEMAR A. SOLF, NEW RULES FOR VICTIMS OF ARMED CONFLICTS: COMMENTARY ON THE TWO 1977 PROTOCOLS ADDITIONAL TO THE GENEVA CONVENTIONS OF 1949, at 233 (2d ed. revision by Michael Bothe, 2013); 2 LASSA OPPENHEIM, INTERNATIONAL LAW 226–27 (1944) (describing the principle of chivalry as introducing a “certain amount of fairness in offence and defence, and a certain mutual respect”).

7. The U.S. Supreme Court has identified on three occasions three maxims of the law of war, including “humanity, moderation, and honor.” *Williams v. Bruffey*, 96 U.S. 176, 191 (1877); *In re The Amy Warwick, The Schooner Crenshaw, The Barque Hiawatha, The Schooner Brillante (The Prize Cases)*, 67 U.S. (2 Black) 635, 667 (1862); *Luther v. Borden*, 48 U.S. (7 How.) 1 (1849) (quoting EMMERICH DE VATTEL, 3 LE DROIT DE GENS OU PRINCIPES DE LA LOI NATURELLE ch. 18, §§ 294–95 (1758)). The U.S. DoD *Law of War Manual* includes five principles: military necessity, humanity, discrimination, proportionality and honor. DOD LAW OF WAR MANUAL, *supra* note 5, ¶¶ 2.2–2.6 (2015). See also UNITED KINGDOM MINISTRY OF DEFENCE, JSP 383, THE MANUAL OF THE LAW OF ARMED CONFLICT ¶¶ 2.2–2.6 (2004) [hereinafter UK MANUAL] (identifying military necessity, humanity, distinction and proportionality); CANADIAN MANUAL, *supra* note 6, ¶ 202.1 (identifying military necessity, humanity and chivalry); FEDERAL MINISTRY OF DEFENCE (GERMANY), ZDV 15/2, LAW OF ARMED CONFLICT MANUAL, ¶¶ 141–42 (2013) [hereinafter GERMAN MANUAL], available at http://usnwc.libguides.com/ld.php?content_id=5616055 (identifying military necessity and humanity); U.S. ARMY FIELD MANUAL 27-10, *supra* note 6, ¶ 3(a) (identifying necessity, humanity and chivalry as basic principles). A casebook published by the International Committee of the Red Cross identifies six principles of international humanitarian law: humanity, necessity, proportionality, distinction, prohibition on causing unnecessary suffering and independence of *jus in bello* from *jus ad bellum*. 1 MARCO SASSÒLI, ANTOINE A. BOUVIER & ANNE QUINTIN, HOW DOES LAW PROTECT IN WAR? Part I, ch. 4, 10–14 (3d ed. 2011), available at <https://www.icrc.org/eng/assets/files/publications/icrc-0739-part-i.pdf>.

8. INTERNATIONAL COMMITTEE OF THE RED CROSS, CONFERENCE OF GOVERNMENT EXPERTS ON THE USE OF CERTAIN CONVENTIONAL WEAPONS 103 (1975) [hereinafter LUCERNE REPORT] (citing among documents distributed at the 1974 Lucerne Con-

of these three principles to weapons takes place primarily through States' internal legal reviews of weapons.⁹ In this vein, Article 36 of Additional Protocol I to the 1949 Geneva Conventions provides,

In the study, development acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.

A few words about how law of war principles and two important precepts concerning public conscience and the environment operate in practice will illustrate the role they play in regulating weapons and weapon technology. At the same time, however, the persistent ambiguity of each principle will become clear, revealing the limits of their capacity to impose restraints on States' resort to new weapons.

A. Unnecessary Suffering

The law of war principle perhaps most closely associated with international regulation of weapons and military technology is the prohibition of unne-

ference a report from an expert from the United Kingdom entitled "Legal Criteria for the Prohibition or Restriction of Use of Categories of Conventional Weapons"); Frits Kalshoven, *Arms, Armaments, and International Law*, 191 RECUEIL DES COURS DE L'ACADÉMIE DE DROIT INTERNATIONAL 183, 324 (1985-II) [hereinafter Kalshoven, *Arms*] (citing Colonel David Hughes-Morgan's paper submitted to the 1974 Lucerne Conference).

9. Protocol Additional to the Geneva Conventions of August 12, 1949, and Relating to the Protection of Victims of International Armed Conflicts art. 36, June 8, 1977, 1125 U.N.T.S. 3 [hereinafter AP I]. See, e.g., Deputy Secretary of Defense, DODD 5000.01, The Defense Acquisition System ¶ E1.1.15 (2003). The United States further implements the customary international law obligation to conduct legal reviews of weapons through service-specific regulations. See Judge Advocate General, Department of the Air Force, AFI51-402, Legal Reviews of Weapons and Cyber Capabilities (2011); Assistant Secretary of the Navy (RD&A), Department of the Navy, SECNAVINST 5000.2C, Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System ¶ 2.6 (2004); Headquarters, Department of the Army, AR 27-53, Review of Legality of Weapons Under International Law (1979). For a detailed perspective on weapons reviews under 1977 Additional Protocol I Article 36 and customary international law, see W. Hays Parks, *Conventional Weapons and Weapons Reviews*, 8 YEARBOOK OF INTERNATIONAL HUMANITARIAN LAW 55 (2005) [hereinafter Parks, *Weapons Reviews*]. For an example of a U.S. weapon review, see W. Hays Parks, *Joint Service Combat Shotgun Program*, THE ARMY LAWYER, Oct. 1997, at 16.

essary suffering, or humanity as it is also known. International codification of the principle of unnecessary suffering is traceable to the 1868 St. Petersburg Declaration, regarded by many as the first multilateral law of war weapons treaty. In addition to its ban on small caliber exploding projectiles, the 1868 Declaration condemned “employments of arms which uselessly aggravate the sufferings of disabled men” as “contrary to the laws of humanity.”¹⁰ Multiple, subsequent law of war instruments and treaties have since reiterated and confirmed the principle. It is widely agreed that the principle of unnecessary suffering is not only a treaty obligation, but also reflects customary international law binding on all States.¹¹

While acknowledgment of the principle has long been practically universal, agreement on the precise meaning and operational limits imposed by the prohibition of unnecessary suffering has not.¹² For instance, a translational issue arose concerning the scope of weapons addressed by the principle early in its history. As stated in the 1874 Brussels Declaration, a non-binding though foundational document for later treaties, the principle

10. Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight, Nov. 29/Dec. 11, 1868, 138 Consol. T.S. 297, 18 Martens Nouveau Recueil (ser. 1) 474 [hereinafter 1868 St. Petersburg Declaration]. In the spirit of the Declaration’s phrasing, some sources refer to a principle of “humanity” in lieu of unnecessary suffering. See also UK MANUAL, *supra* note 7, ¶¶ 2.1, 2.4.

11. See Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 78 (July 8); 1 INTERNATIONAL COMMITTEE OF THE RED CROSS, CUSTOMARY INTERNATIONAL HUMANITARIAN LAW r. 70, at 237 (Jean-Marie Henckaerts & Louise Doswald-Beck eds., 2005) [hereinafter ICRC CIL STUDY]; Henri Meyrowitz, *The Principle of Superfluous Injury of Unnecessary Suffering*, 34 INTERNATIONAL REVIEW OF THE RED CROSS 98, 103 (1994) (judging the customary status of the Hague codification of unnecessary suffering to be “well established”). The ICRC’s customary law study also asserts the principle of unnecessary suffering applies beyond the *rationae materiae* of the treaties governing international armed conflict from which it is drawn. ICRC CIL STUDY, *supra*, at 237. According to the study, unnecessary suffering applies as a matter of custom to non-international armed conflicts. *Id.*

12. See COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, at 403 (Yves Sandoz, Christophe Swinarski & Bruno Zimmermann eds., 1987) [hereinafter 1977 AP COMMENTARY] (observing that the principle of unnecessary suffering was never contested during the several conferences of experts that led to the 1977 Additional Protocols to the Geneva Conventions, although no “wide-ranging agreement on its significance and scope” could be attained). See also LUCERNE REPORT, *supra* note 8, at 7. This report captured the view of some experts assembled to study the possibility of generating weapons regulations who viewed the term “unnecessary suffering” as objectionable in that all suffering in war was unnecessary. *Id.*

prohibits weapons “*calculated to cause unnecessary suffering.*”¹³ The ordinary meaning of the phrase “calculated to” suggested an element of deliberate design or specific intent. Weapons purposely devised to inflict injury beyond that required to accomplish military objectives—most commonly destruction of materiel or rendering combatants *hors de combat*—violate the principle under this meaning. Weapons that incidentally, unintentionally or accidentally inflict unnecessary suffering seem outside the ambit of the principle.

Drawn in large part from the 1874 Declaration, the 1899 Hague Convention’s annexed Regulations included an expression of the principle of unnecessary suffering. However, the English translation of the official French version inexplicably abandoned the term “calculated to cause” in favor of the term “of a nature to cause.” The change presented an interesting interpretive dilemma, at least for English-speaking lawyers. Ordinary canons of interpretation counsel lawyers to render distinct meanings to different terms and phrases. Although the relevant phrases appear in separate legal instruments, the direct lineage between the Brussels Declaration and 1899 Hague Regulations is indisputable. Therefore, some accounting of the change of phrase between instruments certainly seemed in order. The term “nature” referred in this context to the essential qualities or properties of a thing; the inherent and inseparable combination of properties . . . giving it its fundamental character.”¹⁴ Accordingly, resort to the term “of a nature to” seemed to shift the focus of legal reviews of weapons under the unnecessary suffering principle away from the intentions of States and weapon designers and toward the inherent qualities of weapons. Analyses under the “of a nature to” standard might require not only consideration of the weapons designers’ intended effects, but also a more thorough examination of the likely and even possible range of injuries that could result from a weapon’s normal battlefield use. Under this articulation, unintentional, incidental and even accidental infliction of unnecessary suffering might well run afoul of the principle. Efforts to shift analyses of unnecessary suffering to effects of weapons, rather than intended design, have proved difficult to implement and have drawn significant criticism and reservations from

13. Project of an International Declaration concerning the Laws and Customs of War, Brussels art. 13(e), Aug. 27, 1874, *reprinted in* THE LAWS OF ARMED CONFLICTS 23 (Dietrich Schindler & Jiri Toman eds., 4th ed. 2004) [hereinafter 1874 Brussels Declaration] (emphasis added).

14. VII THE OXFORD ENGLISH DICTIONARY 41 (1978).

States.¹⁵ Adding to confusion, the English translation of the 1907 Hague Regulations returned to the phrase “calculated to cause,” although the official French expression remained unchanged.¹⁶ Indeed, to French speakers, the entire debate itself must seem somewhat “unnecessary.”

In 1997, in response to nearly a century of ambiguity surrounding the principle, the International Committee of the Red Cross (ICRC) initiated the Superfluous Injury and Unnecessary Suffering (SIrUS) Project.¹⁷ The SIrUS Project was notable in two respects. First, it introduced a fresh perspective on analyses of the longstanding prohibition on unnecessary suffering. Where previous application of the prohibition had examined the intent of parties employing a weapon or the weapon’s intended design or nature, the SIrUS Project proposed examining weapons’ effects exclusively. Relying heavily on medical reports of survival rates and the state of widely available field medical treatments, the Project then proposed to ban weapons that produced the most severe or untreatable wounds. The Project’s authors purported to supplant subjective State intent to cause unnecessary suffering with an objective medical perspective on the inherent characteristics of weapons.¹⁸

The Project drew from a large ICRC database of war wounds. Parameters included “the proportion of large wounds; mortality; the relative proportion of central and limb injuries; the duration of hospital stay; the number of operations required; the requirement for blood transfusion; and the extent of severe and permanent disability in the survivors.”¹⁹ The Project then correlated these medical parameters with the foreseeable effects of various weapons, but especially small arms bullets. The Project identified four criteria, the presence of any one of which was sufficient to indicate a weapon caused unnecessary suffering.²⁰

15. Donna M. Verchio, *Just Say No! The SIrUS Project: Well-intentioned, but Unnecessary and Superfluous*, 51 AIR FORCE LAW REVIEW 183, 200 n.84 (2001) (describing State reactions to the ICRC’s SIrUS proposal).

16. Regulations Respecting the Laws and Customs of War on Land art. 23(a), annexed to Convention No. IV Respecting the Laws and Customs of War on Land, Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539 [hereinafter 1907 Hague Regulations].

17. INTERNATIONAL COMMITTEE OF THE RED CROSS, THE SIrUS PROJECT: TOWARDS A DETERMINATION OF WHICH WEAPONS CAUSE “SUPERFLUOUS INJURY OR UNNECESSARY SUFFERING” (1997).

18. *Id.* at 5.

19. *Id.* at 7.

20. *Id.* at 23. The four criteria are weapons whose foreseeable effects include:

Apart from appearing to resort to objective criteria, the proposal had the additional benefit of reflecting recent codification of the unnecessary suffering prohibition. Where, as noted above, prior understandings and codifications of unnecessary suffering had prohibited weapons “*calculated to cause unnecessary suffering*,”²¹ the 1977 Additional Protocol I to the Geneva Conventions prohibited weapons “*of a nature to cause . . . unnecessary suffering*.”²² Whichever historical account of the principle forbidding unnecessary suffering proved correct, the SIrUS Project purported to better capture the letter of the ascendant articulation of the law.

Scientific debate and technical quarrels, however, plagued the nascent Project. Beyond objections to resorting exclusively to effects to evaluate unnecessary suffering, States raised a number of methodological questions concerning the data on which the Project relied. That wound data were derived from ICRC rather than military medical hospitals meant the majority of wounds analyzed were to civilians, who lacked medical training, equipment and personnel that usually accompany armed forces and perform first response aid.²³ By 2001, the ICRC abandoned the SIrUS Project and with it further attempts to reduce the abstraction of the principle.²⁴

More than a century after its first codification, vindication of the customary term “calculated to” came (momentarily) in the form of international criminal law. In 1993, the United Nations Security Council created the International Criminal Tribunal for the former Yugoslavia.²⁵ The Tribunal’s statute criminalizes “employment of poisonous weapons or other weapons *calculated to cause unnecessary suffering*.”²⁶ However, less than ten years later, the Rome Statute of the International Criminal Court (ICC), a standing tribunal with jurisdiction over certain war crimes, codified the principle of unnecessary suffering as “employing weapons, projectiles and

(1) specific disease, specific abnormal physiological state, specific abnormal psychological state, specific and permanent disability or specific disfigurement; (2) field mortality of more than 25% or a hospital mortality of more than 5%; (3) Grade 3 wounds as measured by the Red Cross wound classification; or (4) effects for which there is no well recognized and proven treatment.

Id.

21. 1907 Hague Regulations, *supra* note 16, art. 23(e) (emphasis added).

22. AP I, *supra* note 9, art. 35(2) (emphasis added).

23. Verchio, *supra* note 15, at 200 n.84.

24. Parks, *Weapons Reviews*, *supra* note 9, at 88.

25. S.C. Res. 808, U.N. Doc. S/RES/808 (Feb. 22, 1993).

26. Statute of the International Criminal Tribunal for the former Yugoslavia art. 3(a), S.C. Res. 827 annex, U.N. Doc. S/RES/827 (May 25, 1993) [hereinafter ICTY Statute] (emphasis added).

material and methods of warfare which are *of a nature* to cause superfluous injury or unnecessary suffering.”²⁷

Still, the legal status of the ICC Statute’s provision on unnecessary suffering is dubious. The Rome Statute places entry into force of its unnecessary suffering provision on hold. The relevant article is only enforceable “provided that such weapons, projectiles and material and methods of warfare are the subject of a comprehensive prohibition and are included in an annex to this Statute” This compromise was necessary to secure agreement among States and likely reflects the unsettled and wide-ranging views on the principle of unnecessary suffering.²⁸ To date, States have not produced the annex of weapons agreed to cause unnecessary suffering required by the Statute to activate the Court’s jurisdiction. Moreover, the elements of war crimes do not address unnecessary suffering because no such annex has been produced.²⁹ It seems then that prosecution of the principle of unnecessary suffering is at present not within the jurisdiction of the Court—a significant gap in the Court’s power to enforce the law of war and demonstrative of a glaring lack of State commitment to weapons law in the international legal system.³⁰

In sum, it is difficult to identify a generally consistent or accepted manner of interpretation or even articulation of the principle of unnecessary suffering.³¹ There appears to be consistent agreement that some weapons,

27. Rome Statute of the International Criminal Court art. 8.2.(b)(xx), July 17, 1998, 2187 U.N.T.S. 90 [hereinafter ICC Rome Statute] (emphasis added).

28. WILLIAM SCHABAS, *THE INTERNATIONAL CRIMINAL COURT: A COMMENTARY ON THE ROME STATUTE* 243–47 (2010) (relating the negotiating history that produced Article 8.2(b)(xx)).

29. INTERNATIONAL COMMITTEE OF THE RED CROSS, *ELEMENTS OF WAR CRIMES UNDER THE ROME STATUTE OF THE INTERNATIONAL CRIMINAL COURT* 297 (Knut Dörmann et al. eds., 2003).

30. *See id.*; Judith Gardham, *Crimes Involving Disproportionate Means and Methods of Warfare under the Statute of the International Criminal Court*, in *THE LEGAL REGIME OF THE INTERNATIONAL CRIMINAL COURT: ESSAYS IN HONOUR OF PROFESSOR IGOR BLISHCHENKO* 537, 555 (José Doria, Hans-Peter Gasser & M. Cherif Bassiouni eds., 2009).

31. *See* THE JUDGE ADVOCATE GENERAL’S SCHOOL, U.S. ARMY, *LAW OF ARMED CONFLICT DESKBOOK* 155 (2014) (instructing “[t]here is no agreed upon definition for unnecessary suffering”); UK MANUAL, *supra* note 7, ¶ 6.1.2 (noting “the law does not define unnecessary suffering, and views can differ markedly”); *id.* ¶ 6.1.4; 1977 AP COMMENTARY, *supra* note 12, at 410; INTERNATIONAL COMMITTEE OF THE RED CROSS, *CONFERENCE OF GOVERNMENT EXPERTS ON THE USE OF CERTAIN CONVENTIONAL WEAPONS* 8 (1976) [hereinafter 1976 LUGANO REPORT] (noting long-standing dispute over the meaning of unnecessary suffering).

by their nature, cause unnecessary suffering. States have identified weapons employing fragments that evade detection by x-ray, poison and barbed weapons as inflicting needless injury.³² Ultimately, however, the linguistic variations and competing interpretations of the principle of unnecessary suffering may simply reflect the inherent limitations of regulating by resort to principles. As the subsequent principles demonstrate, law of war principles regulate in a very general manner, often relying to a greater degree on States' fidelity to the spirit and purpose of the law rather than to its letter.

B. *Discrimination*³³

No law of war principle enjoys wider acknowledgment than the principle of discrimination.³⁴ At its simplest, the principle of discrimination requires belligerents to maintain a distinction during attacks between combatants and civilians and between military objectives and civilian objects.³⁵ In each case, belligerents must limit attacks to the former and safeguard, to the extent practicable, the latter. Although the principle has been honored to

32. ICTY Statute, *supra* note 26, art. 3(a) (enumerating the crime of “employment of poisonous weapons or other weapons calculated to cause unnecessary suffering”); NAVY COMMANDER’S HANDBOOK, *supra* note 5, ¶ 9-1; UK MANUAL, *supra* note 7, ¶¶ 6.6, 6.11.2; U.S. ARMY FIELD MANUAL 27-10, *supra* note 6, ¶ 34.

33. The term “indiscriminateness” was used by Colonel David Hughes-Morgan to describe how the principle of discrimination applies specifically to legal considerations of weapons at the earliest conference in the process that led to the prevailing regulatory regime for weapons. LUCERNE REPORT, *supra* note 8.

34. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 78 (July 8) (recognizing distinction and humanity as cardinal principles of the law of war).

35. Whether the principle of discrimination—and many other law of war principles and rules of precautions in attack—applies to operations during armed conflict that do not amount to attacks is unsettled. See Michael N. Schmitt, “Attack” as a Term of Art in International Law: The Cyber Operations Context, in 4TH INTERNATIONAL CONFERENCE ON CYBER CONFLICT 283, 289–90 (Christian Czosseck, Rain Ottis & Katarine Ziolkowski eds., 2012) (defining the notion of attack by reference to “violence” and interpreting “attack” as a threshold of application for targeting rules); INTERNATIONAL COMMITTEE OF THE RED CROSS, 31ST INTERNATIONAL CONFERENCE OF THE RED CROSS AND RED CRESCENT: INTERNATIONAL HUMANITARIAN LAW AND THE CHALLENGES OF CONTEMPORARY ARMED CONFLICT 37 (2011) (asserting that principles of the law of war, including military necessity and discrimination, apply to all operations, even those short of attack, during armed conflict).

greatly varying degrees in twentieth century combat,³⁶ its status as *lex lata* is firm, cemented by numerous clear treaty provisions and confirmed by the judgments of recent international criminal law tribunals.³⁷

Discrimination figured early in modern efforts to regulate combat. Little if any disagreement arose concerning the principle's application to attacks and methods of warfare. By the early 1970s, however, a dispute contested the extent to which the principle applied to weapons and means of warfare *per se*. Although experts agreed easily that no weapon could be lawfully employed in an indiscriminate manner or method, the question whether a weapon or means of warfare itself could be regarded as inherently indiscriminate proved more contentious.³⁸ Some experts considered that discrimination only regulated how weapons were used and that no weapon could be preemptively categorized as violating the principle simply by virtue of its nature or properties. At minimum, these experts argued a weapon-focused application of the principle had not yet crystallized into positive law. Other experts contended that indiscriminateness could take the form of a prohibition of weapons that "cannot be accurately directed against military targets" simply by virtue of their properties and regardless of the intention of the parties employing them.³⁹

Vindication of the expansive, now-prevailing view of discrimination with respect to weapons did not take long (at least not by law of war development standards). Additional Protocol I (AP I) to the 1949 Geneva Conventions addresses the principles of the law of war, including intricate treatment of the principle of discrimination. The Protocol articulates a separate dimension of discrimination specifically applicable to weapons

36. See, e.g., PERTTI JOENNIEMI & ALLAN ROSAS, INTERNATIONAL LAW AND CONVENTIONAL WEAPONS: A STUDY ON THE IMPACT OF DIFFERENT APPROACHES AND INTEREST CONFIGURATIONS ON THE EFFORTS TO MODERNIZE THE INTERNATIONAL LEGAL CRITERIA FOR THE CHOICE OF CONVENTIONAL WEAPONS IN WAR 26 (1975). Joenniemi and Rosas report civilian combat losses at about 5 percent of total casualties in World War I, at 50 percent in World War II, at 70–80 percent in the Vietnam War and somewhat lower in hostilities in the Middle East in the late 1960s and early 1970s. *Id.* at 26 n. 1.

37. AP I, *supra* note 9, art. 48; Prosecutor v. Galic, Case No. IT-98-29-A, Appeal Judgment, ¶¶ 190–91 (Int'l Crim. Trib. for the former Yugoslavia Nov. 30, 2006) (identifying the principle of distinction); Prosecutor v. Blaškić, Case No. IT-95-14-A, Appeal Judgment, ¶¶ 109, 113 n.220, 157 (Int'l Crim. Trib. for the former Yugoslavia July 29, 2004) (describing customary duties of discrimination between combatants and civilians).

38. LUCERNE REPORT, *supra* note 8, at 10–11.

39. *Id.*

through provisions widely regarded largely to reflect custom.⁴⁰ To the question whether the principle of discrimination regulates weapons per se, Article 51(4) states in relevant part, “Indiscriminate attacks are: . . . (b) those which employ a method or *means* of combat which cannot be directed at a specific military objective; or (c) those which employ a method or *means* of combat the effects of which cannot be limited as required by this Protocol.”⁴¹

Frequently cited examples of weapons that violate the principle of discrimination per se are certain missiles⁴² and bacteriological weapons.⁴³ Missiles and rockets that lack guidance systems or involve a wide radius of impact error are thought to be indiscriminate because they cannot reliably be aimed at military objectives. A highly respected analysis of AP I, Article 51(4)(b) also cites “‘blind’ weapons” as examples of means that do not comply.⁴⁴ The authors include as specific examples of blind or indiscriminate means, “[a]ttaching incendiary or antipersonnel bombs to free floating balloons” and “[l]and mines, laid without customary precautions.”⁴⁵

Biological and some chemical weapons are generally judged to be indiscriminate by virtue of the uncontrollable nature of their effects under the AP I, Article 51(4)(c) standard. Many biological agents are capable of reproduction and may spread well beyond their intended targets. Some chemical weapons may be scattered beyond their objectives by unpredictable atmospheric conditions. Significant debate exists whether nuclear weapons are inherently indiscriminate or incapable of being directed at a specific military objective. Although the International Court of Justice was unable to conclude in an advisory opinion that nuclear weapons were illegal per se, the Court advised at minimum that their use remained conditioned by the law of war principle of distinction.⁴⁶

40. See DOD LAW OF WAR MANUAL, *supra* note 5, §§ 6.7.2, 6.7.4.

41. AP I, *supra* note 9, art. 51(4) (emphasis added).

42. UK MANUAL, *supra* note 7, ¶ 6.4.1. (citing German V1 flying bombs and Scud missiles used by the Iraqi armed forces during the Persian Gulf conflict of 1991); CANADIAN MANUAL, *supra* note 6, ¶ 509 (citing Scud missiles as examples of weapons that cannot be directed at a specific legitimate target).

43. CANADIAN MANUAL, *supra* note 6, ¶ 516 (citing bacteriological/biological weapons as “affecting the civilian population in an indiscriminate fashion”).

44. BOTHE, PARTSCH & SOLF, *supra* note 6, at 346.

45. *Id.*

46. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 86 (July 8).

C. Honor

Honor, the final fundamental principle considered in the legality of weapons, concerns longstanding notions of noble warfare. The principle of honor has a complicated history in the regulation of not only conduct, but also of weapons deemed acceptable by belligerents. Article 23(b) of the 1907 Hague Regulations forbids parties to “kill or wound treacherously individuals belonging to the hostile nation or army.” The generality of the expression is difficult to explain and leaves much to interpretation. The term “honor” even fell out of use in U.S. military legal doctrine, although it has recently been revived.⁴⁷ For most of its history, States seemed content to leave determinations of honor to subjective interpretation. Later codifications of the principle, however, eliminated some ambiguity, but not without arguably narrowing the principle’s traditionally broad scope of coverage.⁴⁸

Today, honor is codified as the widely acknowledged war crime of perfidy.⁴⁹ The most broadly accepted codification of perfidy is the prohibition found in AP I, Article 37, which states,

It is prohibited to kill, injure or capture an adversary by resort to perfidy. Acts inviting the confidence of an adversary to lead him to believe that he is entitled to, or is obliged to accord, protection under the rules of international law applicable in armed conflict, with intent to betray that confidence, shall constitute perfidy. The following acts are examples of perfidy:

- (a) the feigning of an intent to negotiate under a flag of truce or of a surrender;
- (b) the feigning of an incapacitation by wounds or sickness;
- (c) the feigning of civilian, non-combatant status⁵⁰

47. DOD LAW OF WAR MANUAL, *supra* note 5, §§ 2.6–2.6.3.2.

48. *See generally* Sean Watts, *Law-of-War Perfidy*, 219 MILITARY LAW REVIEW 106 (2014) (detailing various codifications and refinements of the prohibition of perfidy derived from more general notions of treachery).

49. ICC Rome Statute, *supra* note 27, art. 8.2(b)(xi).

50. The United States does not consider the AP I reference to “capture” as an effect sufficient to constitute perfidy under customary international law. DOD LAW OF WAR MANUAL, *supra* note 5, § 5.22.2.1.

Recalling the earlier-mentioned debate concerning discrimination, the AP I expression of perfidy applies far more easily to conduct than to weapons. While not exhaustive, the listed examples describe conduct and methods rather than weapons or means of warfare. Addressing permissible ruses as distinguished from perfidy, AP I delves into means, with mention of “camouflage, decoys, mock information, and misinformation.” The ambit of AP I perfidy might by negative implication include means or weapons that inherently or by their nature—and especially their appearance—betray enemy confidence in law of war protection, such as booby trapped medical supplies or civilian objects. This view is disputed, however, and likely does not attract unanimous support.⁵¹

This view also did not prevail at early weapons review conferences. In 1974, a proposal to address perfidious weapons that failed to secure unanimous support read, “The use of any weapon in such a way that it places the intended victim under a moral, juridical or humanitarian obligation to act in such a way as to endanger his safety, is perfidious.”⁵² Concern emerged that the terms “moral and juridical or humanitarian obligation” were too ambiguous to apply or enforce with respect to weapons.⁵³ The majority of experts preferred to address weapons as being perfidious or treacherous in certain conditions or when they were employed in a prohibited manner, rather than being inherently so.⁵⁴

Today, the principle of honor remains perhaps the most ambiguous of law of war principles applicable to weapons. States appear to remain content with a high degree of abstraction with respect to its content and meaning. All the same, weapons, especially novel weapons, are frequently indicted as treacherous or dishonorable. The weapon most consistently associated with the principle has been poison. Booby traps and other weapons or means of warfare appearing as innocent objects have frequently been judged to be treacherous or dishonorable means of warfare per se.⁵⁵

51. See, e.g., Rogier Bartels, *Killing with Military Equipment Disguised as Civilian Objects is Perfidy*, JUST SECURITY (Mar. 20, 2015), <http://justsecurity.org/21285/disguising-military-weapons-civilian-equipment-perfidy-or-be/>; Kevin Jon Heller, *No, Disguising Military Equipment as Civilian Objects to Help Kill Isn't Perfidy*, JUST SECURITY (Mar. 24, 2015), <http://justsecurity.org/21391/no-disguising-military-equipment-civilian-objects-kill-perfidy/>.

52. LUCERNE REPORT, *supra* note 8, at 70.

53. *Id.*

54. *Id.* at 11, 70.

55. *Id.* at 63–64.

D. The Martens Clause

In addition to the fundamental principles of the law of war, other very general rules and prohibitions of general application have emerged that bear on the legality of weapons during armed conflict. The Hague Convention applicable to land warfare, produced at the First Hague Peace Conference in 1899, included perhaps the most general of law of war restraints still in use today. Drafted and proposed by the formidable Russian chief of delegation to the Hague Conference, Fyodor de Martens, the eponymous Martens Clause reads:

Until a more complete code of the laws of war is issued, the High Contracting Parties think it right to declare that in cases not included in the Regulations adopted by them, populations and belligerents remain under the protection and empire of the principles of international law, as they result from the usages established between civilised nations, from the laws of humanity and the requirements of the public conscience⁵⁶

Martens originally submitted the Clause as a consolation to and enticement of support from smaller European States who feared the Hague treaties would too strictly limit their means of defense against invasion by stronger military powers.⁵⁷ The Martens Clause responded to militarily weak States' misgivings by guaranteeing the continued operation of the law of war, thought by these States as a way to preserve means and methods of defense essential to their survival, especially through resort to unconventional forces and spontaneous resistance by an armed population.

In the nearly 120 years since its first appearance, however, the Clause has taken on a novel role as law of war gap filler. Resort to the Clause is made frequently to support not only the persistent and complimentary role of custom to treaty law, but also the possibility of other legal regimes, such as international human rights law, operating simultaneously with the law of war.⁵⁸ Since 1899, States have included the Clause in a number of major law of war instruments with this purpose clearly in mind.⁵⁹

56. Convention No. II Respecting the Laws and Customs of War on Land pmbl., July 29, 1899, 32 Stat. 1803, T.S. 403, 1 Bevans 247 [hereinafter 1899 Hague Convention II].

57. WILLIAM I. HULL, *THE TWO HAGUE CONFERENCES AND THEIR CONTRIBUTIONS TO INTERNATIONAL LAW* 215–20 (1908).

58. See Michael Salter, *Post-war Developments of the Martens Clause: The Codification of Crimes Against Humanity Applicable to Acts of Genocide*, 2 JOURNAL OF INTERNATIONAL HUMANITARIAN LEGAL STUDIES 250 (2011); Antonio Cassese, *The Martens Clause: Half a Loaf*

One of the chief interpretive difficulties concerning the Martens Clause, especially as applied to weapons, is whether the Clause carries substantive weight of its own. A view expressed in early weapons law conferences considered the terms “laws of humanity” and “requirements of the public conscience” as independent legal standards to be applied and enforced separately from other relevant international legal obligations.⁶⁰ According to this view, all weapons would be reviewed for compliance with these general and open-natured limitations. States adopting new weapons would be required to identify workable standards for “laws of humanity” and presumably measure weapons against these standards. Similarly, and perhaps more problematically, legal reviews of weapons would require attention to seemingly subjective and malleable public conscience or the even more fickle standards of public opinion. Today, interpreted as an independent and self-executing obligation, the Martens Clause would prove a particularly important limitation given that so many weapons, for any number of reasons, have garnered strong public reactions and condemnation.

A competing view, however, has regarded the Martens Clause more narrowly—more as a placeholder or clause of incorporation. According to this view, the terms of the Clause do not constitute legal standards themselves. Instead, they incorporate by reference other norms, requiring a further showing that a norm of international law, separate from those of the

or *Simply Pie in the Sky*, 11 EUROPEAN JOURNAL OF INTERNATIONAL LAW 187 (2000) [hereinafter Cassese]; Theodor Meron, *The Martens Clause, Principles of Humanity, and Dictates of Public Conscience*, 94 AMERICAN JOURNAL OF INTERNATIONAL LAW 78 (2000).

59. See, e.g., Convention No. IV Respecting the Laws and Customs of War on Land pmbl., Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539; Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field art. 63, Aug. 12, 1949, 6 U.S.T. 3114, 75 U.N.T.S. 31; Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea art. 62, Aug. 12, 1949, 6 U.S.T. 3217, 75 U.N.T.S. 85; Convention (III) Relative to the Treatment of Prisoners of War art. 142, Aug. 12, 1949, 6 U.S.T. 3316, 75 U.N.T.S. 135; Convention (IV) Relative to the Protection of Civilian Persons in Time of War art. 158, Aug. 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287; 1977 AP I, *supra* note 9, art. 1(2); Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-international Armed Conflicts pmbl., June 8, 1977, 1125 U.N.T.S. 609; 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 pmbl., Oct. 10, 1980, 1342 U.N.T.S. 137 [hereinafter 1980 CCW].

60. LUCERNE REPORT, *supra* note 8, at 12.

instrument that contains the Clause, provides a rule for decision.⁶¹ The norm in question would thus have to be derived from an independent and accepted source of international law such as treaty or custom.⁶² Under this view, the Clause would incorporate or merely make the clear the continued application of other rules and norms not included in the instrument or legal regime under consideration. A further, still narrower view, perhaps closest to its original intent, denied the Clause legal status at all. This view regarded it as an entirely non-legal, political statement, reminding State parties that law is not the exclusive international limitation on their conduct and that they remain answerable to international politics and opinion.⁶³

A final understanding of the Martens Clause regards the Clause in the nature of an interpretive guide.⁶⁴ Rather than attribute independent substantive force, or for that matter mere incorporation of collateral rules, the interpretive view employs the Clause as a lens through which law of war and other international law rules are applied during armed conflict. According to this view, the terms humanity and public conscience act as guides for the application of rules and the resolution of ambiguities.⁶⁵

For now, it seems non-substantive views of the Martens Clause likely prevail. The chief function of the Clause today is to remind belligerents of the many sources of legal restraints in war. It acts somewhat like a reverse parol evidence clause in contract law.⁶⁶ If a parol evidence clause limits the extent of contracting parties' agreement to terms of a written contract and prohibits resort to extrinsic evidence of legal obligations, the Martens Clause constitutes somewhat the reverse—an open-ended incorporation of the full extent of State parties' relevant legal obligations. Ultimately, neither the substantive view nor the prevailing placeholder view accords especially closely to the original intent or meaning of the Clause, leaving its present—

61. *Id.* at 12.

62. Statute of the International Court of Justice art. 38, June 26, 1945, 59 Stat. 1055, 33 U.N.T.S. 993, 3 Bevens 1179. The Statute is widely regarded as an accurate articulation of the sources of international law.

63. LUCERNE REPORT, *supra* note 8, at 12.

64. Jochen von Bernstorff, *Martens Clause*, MAX PLANCK ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW, ¶ 13 (Dec. 2009), available at <http://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e327>.

65. *Id.* See also Cassese, *supra* note 58, at 190.

66. See Eric A. Posner, *The Parol Evidence Rule, the Plain Meaning Rule, and the Principles of Contractual Interpretation*, 146 UNIVERSITY OF PENNSYLVANIA LAW REVIEW 533, 535 (1998) (citing E. ALLAN FARNSWORTH, CONTRACTS §7.3, at 474 (2d ed. 1990)).

and perhaps future—meanings for purposes of international weapons law somewhat unclear.

E. *Environmental Effects*

A final law of war limitation generally applicable to weapons, which complements but likely does itself not form part of the fundamental principles of the law of war, addresses means of warfare and the environment. The prohibition finds expression in two treaties. First, AP I, Article 35(3) provides, “It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment.” Second, the 1976 Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques (ENMOD) prohibits “military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State party.”⁶⁷ Ratifications of AP I now total 174 States.⁶⁸ Seventy-seven States have ratified ENMOD.⁶⁹ The ICRC has concluded that the prohibitions of Article 35(3) and ENMOD reflect customary international law applicable to international and, “arguably,” to non-international armed conflicts.⁷⁰

Two differences between AP I and ENMOD with respect to weapons regulation merit mention. First, although they share a common concern for persistent environmental effects of hostilities, AP I and ENMOD regulate differently. Where AP I addresses weapons that have extreme *effects* on the environment, ENMOD forbids converting the *environment itself* into a weapon to injure or coerce an enemy. Article II of ENMOD makes clear that the Convention’s prohibition addresses only “deliberate manipulation of natural processes—the dynamics, composition or structure of the

67. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques art. I, Dec. 10, 1976, 31 U.S.T. 333, 1108 U.N.T.S. 151 [hereinafter 1976 ENMOD].

68. *Treaties and States Parties to Such Treaties*, ICRC, <https://www.icrc.org/applic/ihl/ihl.nsf/Treaty.xsp?documentId=D9E6B6264D7723C3C12563CD002D6CE4&action=openDocument> (last visited June 29, 2015).

69. *Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques*, <https://www.icrc.org/applic/ihl/ihl.nsf/Treaty.xsp?documentId=2AC88FF62DB2CDD6C12563CD002D6EC1&action=openDocument> (last visited June 29, 2015).

70. ICRC CIL STUDY, *supra* note 11, r. 45, at 151.

Earth.” The difference is important and explains some States’ persistent objection to AP I, Article 35(3) notwithstanding their ratification of ENMOD,⁷¹ as well as other States’ submissions of understandings with respect to the AP I provision.⁷²

The United States, for instance, while a party to ENMOD, rejects Article 35(3) as an expression of custom, maintaining that the principles of discrimination and proportionality guard against weapons resulting in excessive incidental environmental damage rather than the Article’s specific prohibition.⁷³ Second, it should be noted that where violation of Article 35(3) requires cumulative criteria of “widespread, long-term, and severe damage to the natural environment,” ENMOD enumerates the same criteria disjunctively such that any single effect is sufficient to constitute a breach.

A final consideration regarding weapons and the environment concerns scope of application. Reminiscent of earlier law of war *si omnes* clauses, ENMOD’s prohibition is limited to hostilities among parties.⁷⁴ ENMOD is not as widely ratified as many law of war treaties; however, State parties include admitted and likely nuclear States with the exceptions of France, Israel and South Africa. It is possible that the customary incarnation of ENMOD’s prohibition operates without regard to advance reciprocal commitment, meaning the prohibition would apply universally regardless of the adversary.

Overall, one finds among the principles of the law of war meaningful yet pervasively ambiguous and abstract limits on weapons and war technology. The advantages of regulating weapons by resort to principles such as the prohibitions of unnecessary suffering, indiscriminateness, dishonor and other rules are clear. General principles offer a flexible and adaptive

71. Written Statement of the Government of the United States of America 24 (June 20, 1995), *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996, available at <http://www.icj-cij.org/docket/files/95/8700.pdf> (characterizing AP I, Article 35(3) as a “new rule”).

72. Although it has not ratified AP I, the United States submitted a declaration upon signature stating, “the rules established by this protocol were not intended to have any effect on and do not regulate or prohibit the use of nuclear weapons.” *Protocols Additional to the Geneva Conventions, Reservations and Declarations*, in *THE LAWS OF ARMED CONFLICTS*, *supra* note 13, at 817. France and the United Kingdom submitted understandings of AP I Article 35(3) which state, “risk of damage to the natural environment . . . is to be assessed objectively on the basis of the information available at the time under consideration.” *Id.* at 800, 816.

73. DOD LAW OF WAR MANUAL, *supra* note 5, §§ 6.10.3.1, 19.20.1.5.

74. 1976 ENMOD, *supra* note 67, art. I.

approach to regulation capable of evolving along with State practice and the rapid development of new weapons and technology. It is no accident that these principles have survived as the primary restraints on weapons despite revolutionary changes in armaments. States clearly approve of and appreciate the flexibility and, frankly, the degree of autonomy regulation by resort to broad principles has provided.

Yet it is also clear that regulating weapons by principle entails noteworthy costs and disadvantages. The ambiguity that makes regulation by broad principles attractive to States reluctant to cede sovereignty to the international legal system also greatly limits these principles' effectiveness at humanizing war. As demonstrated above, what amounts to unnecessary suffering is still highly uncertain and determined in most cases by States' individual and subjective evaluations. Similarly, whether means of war amount to treachery or constitute acceptable ruses remains highly indeterminate. Accordingly, the predictive value of law of war principles as restraints on weapons is greatly limited. In light of their inherent ambiguity, as well as significant variance in State practice, it is exceptionally difficult, in all but the most obvious cases, to forecast State consensus as to whether a weapon violates any of these principles.

III. SPECIFIC REGULATIONS AND PROHIBITIONS

Since ancient times, States and other organizations have attempted to develop specific rules applicable to particular weapons alongside general principles. The same considerations that informed the law of war principles prohibiting unnecessary suffering, indiscriminate weapons and dishonor often motivated efforts to regulate or to ban specific weapons outright. Political, economic and other factors also appear to have influenced attempts at weapons bans and regulations and must be considered in any comprehensive understanding of law of war weapons regulations. Despite the many considerations that have gone into weapons law development, understanding the prospects for regulation of weapons benefits profoundly from an examination of the history of efforts to regulate specific weapons. While States' general approaches to, and relationships with, international law have surely been influential, the qualities and properties of various weapons themselves seem to have played a significant part in the development of weapons law.

Early efforts to develop specific weapons rules were not especially successful. By 1863, Dr. Francis Lieber, author of the first major law of war

codification, observed in the code he submitted for adoption by Union forces in the American Civil War, “no conventional restriction of the modes adopted to injure the enemy is any longer admitted.”⁷⁵ However, by the mid-twentieth century, and especially by the late-twentieth century, the prospects for success at regulating weapons through international bans proved brighter. Overall, historical results have been greatly varied, but nonetheless offer useful lessons for future efforts.

A. Poison

Some of the earliest law of war regulations on specific weapons addressed poisons.⁷⁶ Ancient Greeks widely forbade the use of poisoned weapons through custom.⁷⁷ Because of poison’s secretive nature, ancient Indian society codified a comprehensive poison ban.⁷⁸ Romans reportedly regarded use of poison, especially for assassinations, as a form of prohibited treachery and specifically banned its use.⁷⁹ By medieval times, military custom and usage included a poison prohibition.⁸⁰ Academic treatises, so important to the recognition of the custom and usages of the law of war in the period between the Middle Ages and the modern era, also widely acknowledged a ban on poison.⁸¹ By the age of positivism, the poison ban featured consistently and unequivocally in States’ early efforts to codify the law of war in treaties.⁸²

75. U.S. Department of War, Instructions for the Government of Armies of the United States in the Field art. 30, General Orders No. 100, Apr. 24, 1863, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 3 [hereinafter 1863 Lieber Code].

76. *See* 3 ALEXANDER GILLESPIE, A HISTORY OF THE LAWS OF WAR: THE CUSTOMS AND LAWS OF WAR WITH REGARDS TO ARMS CONTROL 87 (2011); DOCUMENTS ON THE LAWS OF WAR 53 (Adam Roberts & Richard Guelff eds., 3d ed. 2001).

77. 2 COLEMAN PHILLIPSON, THE INTERNATIONAL LAW AND CUSTOM OF ANCIENT GREECE AND ROME 209, 221 (1911).

78. THE LAWS OF MANU 28 (Lecture VII, 90) (John Murdoch ed., trans., The Christian Literature Society 1907) (c. 100 B.C.).

79. PHILLIPSON, *supra* note 77, at 231.

80. *See* LESLIE C. GREEN, THE CONTEMPORARY LAW OF ARMED CONFLICT 142 (2d ed. 2000).

81. *See, e.g.*, 3 HUGO GROTIUS, DE JURE BELLI AC PACIS LIBRES ch. 4, §§15–16 (1625), *reprinted in* 2 CLASSICS OF INTERNATIONAL LAW 651–53 (Francis W. Kelsey trans., 1925).

82. 1907 Hague Regulations, *supra* note 16, art. 23(a); Regulations Respecting the Laws and Customs of War on Land art. 23(a), annexed to Convention No. II with Respect to the Laws and Customs of War on Land, July 29, 1899, 32 Stat. 1803, 1 Bevans 247 [hereinafter 1899 Hague Regulations]; 1874 Brussels Declaration, *supra* note 13, art. 13(a);

The origins of humanity's persistent resolve to outlaw the use of poison in warfare are largely instinctive but worthy of study. First, it has been observed that poisons by their nature do not belong. They have been aptly defined as “foreign and dangerous substance[s] placed where they should not be, whether in the human body or the environment. They contravene the natural order.”⁸³ This feature of poisons surely explains much of the human and legal revulsion to their use.

A second, instinctive explanation for the poison taboo is that poisons often thwart expectations—there is a sense that a betrayal accompanies the harm resulting from their use. Poisons most often take their victims unaware and poisoners often evade detection and accountability. Although war is understood to involve death and suffering, poisons upset the equilibrium of lethal expectations to which combatants ordinarily resign themselves by entering combat.

Some scholars identify in humans a strong genetic predisposition against poison use. Primates' innate fear of snakes and arachnids has been identified in primitive human societies. Strategies of poison avoidance, including general contempt for poisons, likely proved essential attributes of surviving lines of primate species.⁸⁴ Humans have historically associated poison use with insects, snakes, and other pests and species of human disdain.⁸⁵ Yet even these “lower species” reserve use of poison to predation and encounters with other species. Examples of conspecific poison use in nature are reportedly rare.⁸⁶ Likewise, although some primitive human societies used poison in warfare, the consensus is that such use was exceedingly uncommon. Even tribes skilled at poison use in hunting appear to have usually refrained from its use against human adversaries.⁸⁷

INSTITUTE OF INTERNATIONAL LAW, THE LAWS OF WAR ON LAND art. 8(a) (1880) *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 29 [hereinafter OXFORD MANUAL]; 1863 Lieber Code, *supra* note 75, art. 16.

83. John Ellis van Courtland Moon, *The Development of the Norm against the Use of Poison: What Literature Tells Us*, 27 POLITICS AND THE LIFE SCIENCES 55, 56 (2008) (emphasis added).

84. Leonard A. Cole, *The Poison Weapons Taboo: Biology, Culture, and Policy*, 17 POLITICS AND THE LIFE SCIENCES 119, 120 (1998).

85. *Id.* at 122.

86. *Id.* (citing NAPOLEON A. CHAGNON, YANOMAMO: THE LAST DAYS OF EDEN 211–14 (1992)); Irenäus Eibl-Eibesfeldt, *The Fighting Behavior of Animals*, 205 SCIENTIFIC AMERICAN 112 (1961).

87. Cole, *supra* note 84, at 123–24 (citing LORNA J. MARSHALL, THE !KUNG OF NYAE NYAE 182, 288 (1976)); GEORGE P. MURDOCK, OUR PRIMITIVE CONTEMPORARIES 176

Human notions linking poison with mysticism and medicine have also been cited to explain the taboo.⁸⁸ Many poisons and their effects evaded human understanding for centuries. Poisons act subtly and slowly in comparison to kinetic weapons. Moreover, the line between poison and remedy has proved fine and difficult to identify. Distinguishing substances that enhanced survival from those that threatened it was an enormously important human undertaking in primitive societies.⁸⁹ Toxic weapons strained finely wrought boundaries between medicine and poison to “offend [a] deep-rooted sensibility” essential to human health.⁹⁰ For many primitive societies, only dangerous and unfamiliar mysticism could provide an explanation of poisons’ effects.

Further cause for the poison ban surely relates to its inhumane effects. Historical accounts of battlefield deaths by poison relate extreme suffering. A history of Alexander the Great’s campaign in India describes the deaths of invaders wounded by the swords of defenders of the city of Harmatelia.

On the king’s side, however, not a few received wounds which all but proved fatal, since the barbarians had anointed their steels with a deadly tincture Accordingly when any one was wounded, his body at once became numb, and sharp pains soon succeeded, while the whole frame was shaken with tremblings and convulsions. The skin became cold and livid, and the stomach discharged bile. A foam, moreover, of a black colour issued from the wound and putrefied. At this stage the poison quickly spread to the vital parts of the body and caused a death of fearful agony. Those, therefore, who had been severely wounded and those who had received nothing more than an accidental scratch suffered equally.⁹¹

Many historical prohibitions of poison appear primarily concerned with assassination rather than large-scale tactical or operational use.⁹² Objections

(1934); Rafael Karsten, *Blood Revenge and War among the Jibaro Indians of Eastern Ecuador*, in *LAW AND WARFARE* 307–8 (Paul Bohannon ed., 1967).

88. Cole, *supra* note 84, at 124.

89. *Id.* at 125.

90. *Id.* (quoting MICHAEL MANDLEBAUM, *THE NUCLEAR REVOLUTION: INTERNATIONAL POLITICS BEFORE AND AFTER HIROSHIMA* 38 (1981)).

91. *THE INVASION OF INDIA BY ALEXANDER THE GREAT* 294–95 (John W. McCrindle ed., 1896).

92. John Doull & M.C. Bruce, *Origin and Scope of Toxicology*, in *TOXICOLOGY: THE BASIC SCIENCE OF POISONS* 6 (Curtis D. Klaassen, Mary O. Amdur & John Doull eds., 3d ed. 1986) (recounting that use of poison for political assassination was common in ancient Greece and during the Middle Ages).

to poison often relate, as will be shown with respect to other weapons, to its potential to enable a weak or under-empowered adversary to upset an established order favoring the strong.⁹³ Poison has shown great potential to convert matches of strength and resources into contests of betrayal and exploitation. The disruptive effect of poison is confirmed by its frequent use as a literary tool capable of arousing tragic pity and venal hatred.⁹⁴

Despite nearly universally professed distaste for its use and subjection to legal proscription, poison has seen intermittent use in warfare.⁹⁵ Professor Gillespie catalogs uses of poisons by ancient and pre-modern armies spanning centuries and cultures, including Greeks, Carthaginians, Romans, Indians, Saracens, English, Spanish and French.⁹⁶ Means of delivery have included edged weapons, projectiles, wine, water, fumes and, most distressingly but perhaps implausibly, *vishakanyas* or “poisonous damsels”—“female courtesans who from early childhood were given doses of poisonous herbs or the venom of snakes and scorpions. By the time they reached adolescence, although they themselves had become immunised, they were deadly poisonous to those who had contact with them, especially intimate contact.”⁹⁷

Breaches and myths notwithstanding, it is perhaps not surprising that poison has attracted a consistent and pervasive record of legal condemnation. Unequivocal poison prohibitions featured prominently in nearly all the major law of war works preceding the Hague Peace Conferences, as

93. Richard Price, *A Genealogy of the Chemical Weapons Taboo*, 49 INTERNATIONAL ORGANIZATION 73, 81 (1995).

94. See van Courtland Moon, *supra* note 83, at 57 (recounting Claudius’s poisoning of Hamlet’s father in Shakespeare’s *Hamlet*).

95. See generally ADRIENNE MAYOR, GREEK FIRE, POISON ARROWS & SCORPION BOMBS: BIOLOGICAL AND CHEMICAL WARFARE IN THE ANCIENT WORLD (2003); ALFRED A. ROBERTS, THE POISON WAR 52–57 (1915).

96. GILLESPIE, *supra* note 76, at 88 (citing TERRY CROWDY, THE ENEMY WITHIN: A HISTORY OF SPIES, SPYMASTERS AND ESPIONAGE 31 (2006) without quotations). Professor Maskeill and Stanford Research Scholar Mayor investigate accounts of poisoned robes or *khiat* in ancient India and other cultures. See Michelle Maskiell & Adrienne Mayor, *Killer Khabilats, Part 1: Legends of Poisoned “Robes of Honor” in India*, 112 FOLKLORE 23 (2001); Michelle Maskiell & Adrienne Mayor, *Killer Khabilats, Part 2: Imperial Collecting of Poison Dress Legends in India*, 112 FOLKLORE 163 (2001) [hereinafter Maskiell & Mayor, *Part 2*].

97. GILLESPIE, *supra* note 76, at 88. Maskiell and Mayor include a reference, but little more, to “poisonous individuals” and “poison damsels sent to infect Alexander the Great,” lending some support to Gillespie’s account. Maskiell & Mayor, *Part 2, supra* note 96, at 165.

well as the regulations of land warfare those conferences produced.⁹⁸ Eliciting objections on the basis of suffering, indiscriminateness, treachery, social disruption, resistance to medical treatment, and perhaps even human genetic predisposition and human evolutionary adaptation, few weapons seem to have combined so many sources of opposition as poison.

B. Crossbow

One of the most familiar historical weapons bans relates to the crossbow. The crossbow emerged in the third century B.C. and proliferated in armies, primarily for use by relatively untrained and lower classes of armed forces.⁹⁹ Later models, especially those using a steel rather than wooden bow, greatly improved the ease of use and penetrating power of the traditional bow.¹⁰⁰ By the eleventh century, a crossbow bolt could reliably pierce the armor of the best-equipped knight.¹⁰¹ By the late twelfth century and until the fourteenth century the crossbow was “the dominant handheld missile weapon in most of western Europe.”¹⁰²

It is widely reported that in 1139 Pope Innocent II at the Second Lateran Council first attempted to ban the use of the crossbow in war.¹⁰³ Ac-

98. See 1863 Lieber Code, *supra* note 75, art. 16; 1874 Brussels Declaration, *supra* note 13, art. 12; OXFORD MANUAL, *supra* note 82, art. 8(a); 1899 Hague Regulations, *supra* note 82, art. 23(a).

99. STEPHEN SELBY, CHINESE ARCHERY 154 (2000).

100. RALPH PAYNE-GALLWEY, THE BOOK OF THE CROSSBOW 31–37 (Toronto: General Publishing Company, 1995) (1903). The comparative merits of the crossbow and longbow have been debated for centuries. The English preference for the longbow manifested itself in domestic law which for centuries prohibited crossbow ownership so as not to degrade from the yeomanry’s skill with the longbow. *Id.* at 34 (citing Parliamentary Acts of 1508, 1512, 1515, 1537 and 1542).

101. *Id.* at 19.

102. *Id.* at 4; David S. Bachrach, *Crossbows for the King: The Crossbow during the Reigns of John and Henry II of England*, 45 TECHNOLOGY & CULTURE 102, 102 (2004).

103. See, e.g., WILLIAM H. BOOTHBY, WEAPONS AND THE LAW OF ARMED CONFLICT 9 (2009); Adam Roberts and Richard Guelff trace a Papal ban on the crossbow and arbalest to a Lateran Council of 1132 rather than 1139. DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 53.

Canon 29 of the Second Lateran Council states, “We forbid under penalty of anathema that that deadly and God-detested art of slingers and archers be in the future exercised against Christians and Catholics.” A commentary on the Second Lateran Council Canon appears to challenge the standard account of the Council’s treatment of the crossbow. The commentary surmises that Canon 29 actually referred to a practice of wagering on archery at tournaments, a practice previously addressed by the Lateran Synod of 1097. MEDIEVAL

counts indicate the Council concurred that the crossbow was “deadly and odious to God.”¹⁰⁴ Bows and other projectile weapons had been discredited far earlier than the Middle Ages. Greek and other ancient societies often scorned the bow and javelin as inconsistent with honorable warfare and agreed to prohibit their use in some conflicts.¹⁰⁵ Later, German Emperor Conrad III reportedly banned the crossbow’s use and made its use punishable by death.¹⁰⁶

But the crossbow posed much more than a mere tactical threat. Leveling the battlefield between elite, mounted warriors of the nobility and largely untrained, amateur conscripts, the crossbow was feared to have revolutionary effects on established political, military and social orders. Historians note the crossbow’s important contributions to shifting meta-trends in warfare. It is thought that a crossbow killed the English king Richard the Lionheart, but its disruptive effects date to even earlier times.¹⁰⁷ The first episodes of true warfare are thought to have involved periodic invasions by mounted nomads against sedentary agrarians.¹⁰⁸ For centuries tactical advantage rested decisively with the mounted raider. The crossbow later afforded agrarian peoples a means of defense at once effective and easily employed, shifting military hegemony away from mounted, professional warrior classes of nomadic peoples such as the Mongols, in favor of stable

SOURCEBOOK: TENTH ECUMENICAL COUNCIL: LATERAN II 1139, *available at* <http://legacy.fordham.edu/halsall/basis/lateran2.asp> (last visited July 29, 2015). The author has inadequate background to judge the accuracy of either the standard view or this competing interpretation.

104. Miguel A. Marin Luna, *Evolution*, 92 RECUEIL DES COURS DE L’ACADÉMIE DE DROIT INTERNATIONAL 647, 655 (1957).

105. GILLESPIE, *supra* note 76, at 8. *See also* VICTOR DAVIS HANSON, WARS OF THE ANCIENT GREEKS 38–29 (1999) (describing disdain for archers as “cowards who avoid face-to-face fighting”).

106. *Id.* at 12.

107. *Id.* (citing CHRISTINE DE PISSAN, THE BOOK OF FAYTTES OF ARMES AND OF CHYVALRYE 217 (A. T. P. Byles ed., William Caxton trans., Oxford University Press, 1932) (1409)); PAYNE-GALLWEY, *supra* note 100, at 4. Van Creveld also credits development of fortifications and fortresses with the demise of nomadic warriors and the rise of sedentary civilizations. MARTIN VAN CREVELD, TECHNOLOGY AND WAR: FROM 2000 B.C. TO THE PRESENT 23 (1989).

108. ROBERT L. O’CONNELL, OF ARMS AND MEN: A HISTORY OF WAR, WEAPONS, AND AGGRESSION 7 (1989).

and sedentary populations like the Chinese, Byzantine and European civilizations.¹⁰⁹

As a testament to its effectiveness and the weakness of extant weapons law, orders to develop new crossbow technology and widespread deployment of crossbows post-date most efforts to eliminate use of the weapon. By the fourteenth century, the crossbow's place in the arsenals of Europe was cemented.¹¹⁰ Castle owners required tenants and soldiers to own crossbows.¹¹¹ Some cities mandated crossbow ownership as a requirement of citizenship. Even the nobility seems to have warmed to them, reportedly making frequent diplomatic gifts of crossbows.¹¹²

Therefore, despite moral, religious and even strong political objections, efforts to ban lawful use of the crossbow largely represent a legislative failure.¹¹³ Its enormous effectiveness and widespread deployment secured its place despite mild and selective notoriety. The crossbow offered little to justify its prohibition other than its potentially disruptive effect on established military hegemony and order. Ultimately, it seems only technological advance itself, through the development of gunpowder and firearms could eliminate the crossbow from the battlefield.

C. Firearms and Bullets

Mindful of the battlefield disruption and threats to long-established combatant hierarchies posed by the crossbow, sovereigns resorted to weapons law to regulate firearms as well.¹¹⁴ Perhaps no means of warfare has a history of regulation as long, as complicated and as controversial as that of small arms bullets. Yet efforts to regulate bullets have met with only sporadic success and, over time, the positions of even initially successful regulations seem to have become less secure.

Surely motivated to preserve established social order, States sought first to restrict use of firearms to the nobility.¹¹⁵ The emperor of Japan, eager to

109. David Curtis Wright, *Nomadic Power, Sedentary Security, and the Crossbow*, 58 ACTA ORIENTALIA ACADEMIAE SCIENTIARUM HUNGARICAE 15 (2005).

110. Bachrach, *supra* note 102, at 102.

111. Dirk H. Breiding, *The Crossbow of Count Ulrich V of Württemberg*, 44 METROPOLITAN MUSEUM JOURNAL 61, 61 (2009).

112. *Id.*

113. Parks, *Weapons Reviews*, *supra* note 9, at 61.

114. CHARLES FENWICK, INTERNATIONAL LAW 667 (4th ed. 1965).

115. GILLESPIE, *supra* note 76, at 14 (noting fifteenth and sixteenth century English and French laws setting minimum incomes for firearms ownership).

preserve the culture and status of his elite samurai warrior class, imposed an early government monopoly on firearms to ensure they would all be destroyed.¹¹⁶

Later attempts to regulate firearms evolved to address concerns beyond sustaining elite hegemonies. By the mid-nineteenth century a growing sense of humanity and alarm at unnecessary suffering caused by new bullet designs led private organizations and even States to seek international regulations. In 1863, Russian engineers developed a small caliber exploding bullet designed for use against ammunition wagons.¹¹⁷ By 1867, engineers modified these bullets to explode on impact with soft tissue such as the human body.¹¹⁸ Although militaries also employed them for benign uses, such as range finding in mountainous regions,¹¹⁹ use against persons reportedly prompted Russian Tsar Alexander II to propose a conference to form a treaty renouncing the use of lightweight, exploding projectiles.¹²⁰ The prevailing thinking at the conference was that bullets designed to explode on contact with human tissue inflicted suffering greater than that required to put targeted soldiers out of combat.¹²¹

The Tsar's conference produced in relatively short order the 1868 St. Petersburg Declaration.¹²² By the Declaration's terms, the parties agreed "to renounce, in case of war among themselves, the employment by their military or naval troops of any projectile of a weight below 400 grammes, which is either explosive or charged with fulminating or inflammable substances."¹²³ Through signature and eventual accession, nineteen States joined the treaty, including many major military powers.¹²⁴

116. NOEL PERRIN, *GIVING UP THE GUN: JAPAN'S REVERSION TO THE SWORD 1543-1879* (1979).

117. *THE LAWS OF ARMED CONFLICTS*, *supra* note 13, at 91.

118. *Id.*

119. Kalshoven, *Arms*, *supra* note 8, at 327 n.14 (citing George V. Fosbery, *Explosive Bullets and Their Application to Military Purposes*, 12 *ROYAL UNITED SERVICES INSTITUTE JOURNAL* 15 (1869)).

120. *DOCUMENTS ON THE LAWS OF WAR*, *supra* note 76, at 53; *THE LAWS OF ARMED CONFLICTS*, *supra* note 13, at 91.

121. Tom Ruys, *The XM25 Individual Airburst Weapon System: A "Game Changer" for the (Law on the) Battlefield? Revisiting the Legality of Explosive Projectiles under the Law of Armed Conflict*, 45 *ISRAEL LAW REVIEW* 401, 406 (2012).

122. 1868 St. Petersburg Declaration, *supra* note 10.

123. *Id.*

124. *DOCUMENTS ON THE LAWS OF WAR*, *supra* note 76, at 56. Roberts and Guelff indicate the Declaration did not require instruments of ratification, leaving States' signatures as sufficient for entry into force. *Id.* at 56 n.2.

Three decades after the 1868 Declaration and again at the invitation of a Russian Tsar, this time Nicholas II, States met to consider further law of war limitations on bullets. At the 1899 Hague Peace Conference, in addition to a convention and regulations on the general law of land warfare, States produced a declaration prohibiting use of bullets that flatten easily in the human body.¹²⁵ Manufactured with an exposed tip or with incisions on the outer hard jacket to permit a soft lead core to expand on impact, so-called dum-dum bullets were designed to increase stopping power and produced greatly aggravated wounds.¹²⁶ Persuaded by arguments that bullet expansion needlessly intensified suffering, the majority of States present at the Hague expressed early support during the conference for a ban on expanding bullets.

The United Kingdom, paired with the United States, led efforts to preempt the Hague prohibition. The Anglo powers, the UK in particular, argued that expanding bullets were essential to counter fanatical native resistance in colonial possessions.¹²⁷ Anglo-American representatives also contested the scientific and practical bases for the prohibition, insisting States would simply adopt larger calibers to compensate for the loss of stopping power. The Declaration went forward, however, and provided, “The contracting Parties agree to abstain from the use of bullets which expand or flatten easily in the human body.”¹²⁸ Most major military powers joined the 1899 Declaration with ratifications, accessions and successions extending to as late as 1978, including the UK in 1907, but never the United States.¹²⁹

Whether concern for humanity and prevention of superfluous injury actually motivated all the parties to the St. Petersburg and Hague Declarations is debatable.¹³⁰ With respect to the 1899 Declaration, humanitarian

125. Declaration (IV, 3) Concerning Expanding Bullets, July 29, 1899, 187 Consol. T.S. 459, 26 Martens Nouveau Recueil (ser. 2) 1002, *reprinted in* DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 64. [hereinafter 1899 Hague Expanding Bullets Declaration].

126. Alex Ogston, *The Peace Conference and the Dum-Dum Bullet*, 2 BRITISH MEDICAL JOURNAL 278 (1899) (providing illustrations of wounds produced by various bullet types); J. B. Hamilton, *The Evolution of the Dum-Dum Bullet*, 1 BRITISH MEDICAL JOURNAL 1250–51 (1898).

127. Ogston, *supra* note 126, at 278.

128. 1899 Hague Expanding Bullets Declaration, *supra* note 125, para. 2.

129. DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 65–66.

130. Professor Kalshoven appears to have changed his view concerning Russian motivation for convening the International Military Commission that produced the St. Pe-

motives are undermined somewhat by the parties' agreement to ban use only in armed conflict among themselves.¹³¹ Under the Declaration, State parties were free to use expanding bullets in conflicts with non-State parties and even in conflicts with one another should a non-State party join either side as a belligerent.¹³² This limitation likely explains the UK's later ratification of the Declaration, given that its objections related chiefly to perceived requirements of colonial warfare. With respect to the 1868 Declaration, some speculate Russia feared an arms race involving exploding projectiles that it could ill afford to win.¹³³ At minimum, the Tsar's communications to European powers, bemoaning the costs of funding the then-prevailing state of armed peace, support the theory.¹³⁴

Notwithstanding occasional additions of new State parties throughout the twentieth century, the legacies of the 1899 Expanding Bullets Declaration and the 1868 St. Petersburg Declaration are mixed and, in the case of the latter, quite uncertain. The legal status of the 1899 Declaration is now somewhat stable though not without reservation. It is widely agreed that *general* use of expanding bullets violates customary international law.¹³⁵

tersburg Declaration. In his 1973 treatise, he observed "no . . . elite or Party interest can be discerned." FRITS KALSHOVEN, *THE LAW OF WARFARE* 87–88 (1973). Twelve years later he admitted to a change of view, observing, "Russian concern at the vulnerability of its troops for the new bullets . . . had prompted its convening of the Commission." Kalshoven, *Arms*, *supra* note 8, at 208.

131. See Parks, *Weapons Reviews*, *supra* note 9, at 69 (characterizing the 1899 Hague Declaration Concerning Expanding Bullets as "an arms control agreement").

132. 1899 Hague Expanding Bullets Declaration, *supra* note 125, paras. 3–4.

133. See James L. Tryon, *The Hague Conferences*, 20 *YALE LAW JOURNAL* 470, 471 (1911).

134. Foreign Office, Imperial Russia, *The Rescript of the Russian Emperor* (Aug. 24, 1898), reprinted in FREDERICK W. HOLLS, *THE PEACE CONFERENCE AT THE HAGUE AND ITS BEARINGS ON INTERNATIONAL LAW AND POLICY* 8–10 (1900).

135. See ICC Rome Statute, *supra* note 27, art. 8.2(b)(xix) & (e)(xv). The Court's elements of crimes clarify that the Statute only makes criminal instances where the perpetrator was aware the expanding bullet would "uselessly aggravate suffering or the wounding effect." Review Conference of the Rome Statute of the International Criminal Court, Kampala, Uganda, May 31–June 11, 2010, ICC Doc. RC 9/11, at 13, available at http://www.icc-cpi.int/iccdocs/asp_docs/ASP9/OR/RC-11-ENG.pdf. The elements seem to exclude uses of expanding bullets where expansion on impact is calculated to reduce aggregate suffering or to minimize overall harm. *Id.* However, the study of the customary law of war produced by the ICRC asserts an unqualified prohibition on use of expanding bullets. ICRC CIL STUDY, *supra* note 11, r. 77, at 268.

States' adherence to the prohibition seems to have been relatively strong.¹³⁶ Even the United States, a non-party to the Declaration, has indicated it would apply its terms to international armed conflicts.¹³⁷ Exceptions to the prohibition likely exist for circumstances where expanding bullets' tendency not to over-penetrate an intended target would result in a more humane outcome, such as in hostage rescue situations, or where use of an open tipped bullet would enhance long-range accuracy and thereby reduce the risk of collateral damage.¹³⁸

The legal status of the 1868 Declaration is considerably less clear. Experts and NGOs offer a wide range of conclusions.¹³⁹ By the early 1920s State practice and draft rules for air combat seemed to relax the ban on use of explosive bullets. Draft rules for air warfare permitted use of explosive projectiles "by or against aircraft" even for parties to the 1868 Declaration.¹⁴⁰ Later, a dispute concerning development of exploding 12.7 millimeter rounds, which clearly fell within the relevant 400 gram weight restriction, also seemed to call the reach of the Declaration into question.¹⁴¹ A number of States developed and widely deployed exploding small arms projectiles in this period for use against lightly armored vehicles. By design, these rounds explode upon impact with hard surfaces to augment penetration and also to inflict concussion and fragmentation injuries on vehicle occupants. States that had fielded these rounds determined their design for anti-materiel use rather than anti-personnel use exempted them from the Declaration, as well as from any customary norm.¹⁴² As perhaps a further reflection of recent State opinion with respect to the Declaration's ban, the

136. GILLESPIE, *supra* note 76, at 24 (reporting early use of dum-dum and explosive bullets to have been "surprisingly controlled").

137. W. Hays Parks, *Memorandum of Law—Sniper Use of Open-Tip Ammunition*, THE ARMY LAWYER, Feb. 1991, at 86, 87.

138. See Alfons Vanheusden, W. Hays Parks & William H. Boothby, *Use of Expanding Bullets in Military Operations*, 50 MILITARY LAW AND THE LAW OF WAR REVIEW 535, 546 (2011); Joshua Berry, *Hollow Point Bullets: How History Has Hijacked Their Use in Combat and Why It Is Time to Reexamine the 1899 Hague Declaration concerning Expanding Bullets*, 206 MILITARY LAW REVIEW 88 (2010).

139. See, e.g., Richard R. Baxter, *Conventional Weapons under Legal Prohibitions*, 1 INTERNATIONAL SECURITY 42, 43 (1977) (concluding the 1868 Declaration "passed into general international law and thus to be obligatory for all states").

140. Hague Rules Concerning the Control of Wireless Telegraphy and Air Warfare, Dec. 11, 1922–Feb. 17, 1923, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 315.

141. See Parks, *Weapons Reviews*, *supra* note 9, at 90–97.

142. *Id.*

ICC Statute does not include use of exploding, small caliber munitions in its list of war crimes subject to the Court's jurisdiction, whereas expanding bullets are included.¹⁴³ Academic commentaries have also raised substantial questions concerning the continued force and customary status of the 1868 Declaration.¹⁴⁴

The ICRC concluded recently, however, that anti-personnel use of exploding bullets constitutes a customary international law of war violation.¹⁴⁵ In a brief and selective response to the ICRC study, the United States vehemently rejected the conclusion that customary international law prohibited all anti-personnel use of explosive rounds.¹⁴⁶ The U.S. view appears only to prohibit projectiles designed specifically (and perhaps exclusively) to explode in the human body.¹⁴⁷ At present, it may be safest to conclude that only rounds specifically designed or employed to explode on contact with human tissue are covered by customary international law equivalent to the 1868 Declaration.¹⁴⁸ State parties to the Declaration are possibly subject to the stricter rule in combat between themselves, banning explosive projectiles simply by reference to weight rather than intended target, although there is evidence that State practice may have carved out an exception for anti-materiel uses.¹⁴⁹

In somewhat recent chapters of the international effort to regulate small arms projectiles, the United Nations sponsored meetings preparatory to a Second Review Conference to the 1980 Convention on Certain Conventional Weapons in 1997 1999, and 2001.¹⁵⁰ These efforts attempted to address small caliber bullets more directly through the Convention's Article 8 review conference procedures. Initial meetings intended to lead to an Article 8 conference proposed deliberate and scientific examination of bullet

143. See ICC Rome Statute, *supra* note 27, art. 8.

144. JOENNIEMI & ROSAS, *supra* note 36, at 30; Baxter, *supra* note 139, at 43 (limiting the customary obligation of the Declaration to anti-personnel use of exploding bullets).

145. ICRC CIL STUDY, *supra* note 11, r. 78, at 272.

146. John B. Bellinger III & William J. Haynes II, *A US Government Response to the International Committee of the Red Cross Study Customary International Humanitarian Law*, 89 INTERNATIONAL REVIEW OF THE RED CROSS 443 (2007).

147. *Id.*

148. Kalshoven, *Arms*, *supra* note 8, at 223 (observing “[p]robably, the only remnant of the one-time sweeping ban [on explosive bullets] is a prohibition to use such projectiles against human beings”).

149. See UK MANUAL, *supra* note 7, ¶¶ 6.10–6.10.2; Ruys, *supra* note 121, at 409–10 (citing MINISTRY OF DEFENCE, UNITED KINGDOM, D/DAT/13/35/66, THE LAW OF ARMED CONFLICT (1981)).

150. Parks, *Weapons Reviews*, *supra* note 9, at 88.

wounds, including establishing an international wound ballistics testing facility. State representatives at these meetings, however, rejected the proposal, as well as inclusion of a small caliber bullet provision on the Second Review Conference agenda.¹⁵¹

In sum, experience with regulating small arms projectiles has met a fate largely similar to that of earlier efforts with respect to the crossbow. Initial desire to regulate small arms to prevent disruption to existing political and military hegemonies did not prove an adequate basis to support law of war regulation. Nor could initial notoriety muster sufficient inertia to generate significant international regulation. The effectiveness—and later wide-scale deployment of firearms and their various projectiles—proved firearms and their projectiles to be exceptionally regulation resistant. Although colorable arguments and demonstrable success were made concerning some bullets with respect to unnecessary suffering and complications associated with medical treatment, States have increasingly strained against even limits as deep-rooted and longstanding as the 1868 and 1899 Declarations. Currently, the ban of the former is widely regarded as obsolete, while the latter operates subject to a progressively growing number of contextual exceptions.¹⁵²

D. Submarines

Although early submarines did not employ novel weapons—surface ships mounted most of the same guns and torpedoes—their introduction to warfare rapidly attracted international legal attention.¹⁵³ By the early twentieth century, after repeated failed efforts to control submarine production, select States resolved to develop limitations on their use. Specifically, a contingent of States led by the United Kingdom sporadically supported by the United States, proposed rules for the use of submarines against merchant shipping. Ultimately however, submarines proved exceptionally resistant to specific regulations and today operate under few, if any, regulations other than those generally applicable to all weapons.

151. *Id.* at 89 (relating personal knowledge as the U.S. representative at these meetings).

152. See Berry, *supra* note 138, at 149–51.

153. W. THOMAS MALLISON, STUDIES IN THE LAW OF NAVAL WARFARE: SUBMARINES IN GENERAL AND LIMITED WARS 151 (1966) (Vol. 58, U.S. Naval War College International Law Studies).

Framed and shepherded through debates by U.S. delegate Elihu Root, early rules on the use of submarines against merchant shipping featured prominently at the 1922 Washington Naval Conference. Root's rules, ultimately codified in the conference's draft submarine treaty, at Article 1 stated,

A merchant vessel must be ordered to stop for visit and search to determine its character before it can be seized. A merchant vessel must not be attacked unless it refuses to submit to visit and search after warning or to proceed as directed after seizure. A merchant vessel must not be destroyed unless the crew and passengers have been first placed in safety.¹⁵⁴

The article then provided, "if a submarine cannot capture a merchant vessel in conformity with these rules . . . [it must] desist from attack . . . and permit the merchant vessel to proceed unmolested."¹⁵⁵

Limiting submarines' operations had long enjoyed support in the form of public opinion. Parks relates that the American delegation to the Washington Naval Conference received 400,000 letters and telegrams calling for restraints on submarines compared to 4,000 supporting free use of submarines.¹⁵⁶ Still, the impracticable requirements of the Washington Conference rules were immediately apparent to States' representatives. States also identified ambiguity concerning the scope of vessels regarded as merchants as a source of concern and the draft treaty never entered force.¹⁵⁷

Undeterred, submarine antagonists revisited the subject at the 1930 London Naval Conference. Citing interests of humanity, but also motivated by their desire to guard their still-significant surface fleet, the British hosts argued for a complete ban on submarines.¹⁵⁸ While the conference saw the United States reverse course to favor the ban, other States—especially Japan—were opposed. As an alternative, the British representa-

154. Treaty Relating to the Use of Submarines and Noxious Gases in Warfare art. 1, Feb. 6, 1922, 25 L.N.T.S. 202, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 1139 [hereinafter Submarines and Gases Treaty].

155. *Id.*

156. W. Hays Parks, *Making Law of War Treaties: Lessons from Submarine Warfare Regulation*, in INTERNATIONAL LAW ACROSS THE SPECTRUM OF CONFLICT: ESSAYS IN HONOUR OF PROFESSOR L.C. GREEN ON THE OCCASION OF HIS EIGHTIETH BIRTHDAY 339, 348 (Michael N. Schmitt ed., 2000) (Vol. 75, U.S. Naval War College International Law Studies) [hereinafter Parks, *Lessons*].

157. *Id.* at 351.

158. *Id.* at 353.

tives proposed a resurrection of the 1922 submarine treaty draft rules.¹⁵⁹ The Conference adopted the rules, but they saw limited ratification and only mild enthusiasm for implementation, especially in Japan.¹⁶⁰ By 1936, Japan announced its withdrawal from the London Treaty.

Despite Japanese withdrawal, the United States and Britain led a second London Naval Conference in 1936. The second conference produced a *Procès-Verbal* to the 1930 Treaty of London which stated in the relevant part,

except in the case of a persistent refusal to stop on being summoned, or of active resistance to visit or search, a warship, whether surface vessel or submarine, may not sink or render incapable of navigation a merchant vessel without having first placed passengers, crew and ship's papers in a place of safety.¹⁶¹

Although more widely ratified, the 1936 *Procès-Verbal* proved ineffective at regulating submarine warfare during the Second World War. No major naval power adhered to its provisions.¹⁶² Contempt for the *Procès-Verbal* even extended to the International Military Tribunal at Nuremberg, where the Tribunal awarded no punishment to German Navy Chief Karl Dönitz, despite adjudging technical convictions for violations of its rules against him.¹⁶³

Parks offers a number of insightful observations concerning the *Procès-Verbal*. First, he attributes failure of the *Procès-Verbal* submarine rules to their adoption in place of failed arms control efforts. Clearly intended to render submarines obsolete, the rules attempted to achieve through humanitarian regulation what could not be achieved through arms control. Second, he characterizes its rules as a disingenuous effort to alter strategic

159. *Id.* at 354 (relating, however, that British Navy officials were by no means unanimous in their support for resurrecting the 1922 rules). See also DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 169 (Roberts and Guelff explaining that French refusal to ratify prevented the Treaty from entering into force).

160. Parks, *Lessons*, *supra* note 156, at 355.

161. *Procès-Verbal* Relating to the Rules of Submarine Warfare Set Forth in Part IV of the Treaty of London of 22 April 1930, Nov. 6, 1936, 173 L.N.T.S. 353, reprinted in THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 1145.

162. Parks, *Lessons*, *supra* note 156, at 342. In fact, Parks has concluded that at least two powers' deviation from the provisions of the *Procès-Verbal* was "instant and unhesitating." *Id.*

163. 22 TRIAL OF MAJOR WAR CRIMINALS AT THE INTERNATIONAL MILITARY TRIBUNAL 559 (1948).

and operational balances of power and arms through law of war regulation.¹⁶⁴ This second observation, concerning disruption, fits similarly failed efforts with respect to the crossbow and early firearms regulations. Finally, and perhaps most importantly, Parks notes that international law regulation of submarines may have been doomed to failure all along because they were such an effective means of warfare.¹⁶⁵ Their wide-scale deployment by the Second World War, as well as the unprecedented access they offered to the vulnerabilities of the world's surface fleet, surely contributed to their regulation resistance as well.

E. The Convention on Certain Conventional Weapons

In 1968, an international conference on human rights held in Tehran¹⁶⁶ sparked not only several years of the most intense law of war development in modern history, it also ignited a brief turf war concerning sponsorship of law of war development. Inspired by the Tehran conference, the UN General Assembly invited the Secretary-General to study the “need for additional humanitarian international conventions and rules.”¹⁶⁷ In response, and clearly anxious to preserve its traditional role in law of war development, the ICRC initiated a competing series of meetings of its own. Following the UN and ICRC meetings, and what was for practical purposes a twenty-five-year hiatus on law of war treaty development, States formally met in 1974 to consider amendments and additions to the 1949 Geneva Conventions.¹⁶⁸ After significant wrangling, States declined to address the topic of weapons regulation at the ICRC-sponsored diplomatic conferences that produced the 1977 Additional Protocols. But agreement emerged simultaneously to address weapons separately, under UN auspices.¹⁶⁹

164. Parks, *Lessons*, *supra* note 156, at 365.

165. *Id.* at 366.

166. International Conference on Human Rights, Teheran, Iran, April 22–May 13, 1968, *Final Act of the International Conference on Human Rights*, U.N. Doc. A/CONF.32/41 (May 13, 1968) [hereinafter *Tehran Conference Final Act*].

167. G.A. Res. 2444 (XXIII), ¶ 2(b), U.N. Doc. A/7218 (Dec. 19, 1968).

168. For thorough accounts of the proceedings of the 1974–77 Diplomatic Conference and the resulting Protocols to the 1949 Geneva Conventions, see generally BOTHE, PARTSCH & SOLF, *supra* note 6.

169. See G.A. Res. 32/152, U.N. Doc. A/RES/32/152 (Dec. 19, 1977); Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts, Geneva, 1974–1977, Resolution 22, *Follow-up Regarding*

A series of meetings of government experts attempted to identify common ground between States concerning the regulation of conventional weapons and to study technical and medical issues.¹⁷⁰ These meetings proved to be a broad effort to identify opportunities for progress in the regulation of weapons. Their labors eventually produced the important, but clumsily named 1980 Convention on Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects (CCW).¹⁷¹ The CCW addresses specific weapons States deem to be inconsistent with the fundamental law of war principles of discrimination and unnecessary suffering.

The CCW envisions an iterative, open-ended procedure for amendment and expansion. In fact, the base CCW actually contains no substantive rules concerning weapons. Instead, Article 8 permits State parties to convene periodically to consider protocols respecting categories of weapons or to amend existing CCW protocols on specific weapons.¹⁷² Simple majorities are insufficient to add new protocols to the CCW regime—all State parties to the CCW must join in consensus to add a protocol. While onerous, the consensus requirement has been an important, if controversial, facet of the CCW process since its formative meetings and conferences.¹⁷³

Prohibition or Restriction of Use of Certain Conventional Weapons, June 9, 1977, reprinted in *THE LAWS OF ARMED CONFLICTS*, *supra* note 13, at 827 (recommending a Conference of Governments convene not later than 1979 to reach agreement on prohibiting or restricting “weapons . . . which may be deemed to be excessively injurious or have indiscriminate effects”).

170. See INTERNATIONAL COMMITTEE OF THE RED CROSS, REPORT ON THE WORK OF EXPERTS: WEAPONS THAT MAY CAUSE UNNECESSARY SUFFERING OR HAVE INDISCRIMINATE EFFECTS (1973); LUCERNE REPORT, *supra* note 8; 1976 LUGANO REPORT, *supra* note 31. For useful summaries of these conferences, see Kalshoven, *Arms*, *supra* note 8, at 230–42.

171. 1980 CCW, *supra* note 59.

172. *Id.*, art. 8.

173. LUCERNE REPORT, *supra* note 8, at 97 (reproducing rules of the Conference). Rule 8 provided, “The Conference shall not adopt any resolution or recommendation and shall not vote. When differing views are expressed on a point and the discussion does not result in conclusions acceptable to all, note shall be taken of the different opinions expressed.” *Id.* The requirement of producing consensus, rather than resolutions expressed by majority vote, was essential to securing agreement of a number of parties, including the United States, to participate. See Kalshoven, *Arms*, *supra* note 8, at 232–33 (noting considerable differences of opinion between States and compromises required to secure agreement to attend the weapons conferences that led to the CCW).

Although a fifteen-year gap intervened between conclusion of the original CCW conference and its first Article 8 review conference, the CCW review process has been one of the most active in the history of the law of war.¹⁷⁴ Following the first review conference, held in 1996, the CCW State parties resolved to hold subsequent review conferences every five years.¹⁷⁵ The CCW now includes comprehensive weapons bans on both non-detectable fragments and blinding lasers, as well as two protocols that greatly restrict use of landmines and incendiaries and a protocol outlining significant responsibilities with respect to weapons that produce unexploded remnants. Still, the record of success at the CCW remains mixed. To date the CCW process has debated, but failed to achieve consensus on a number of other weapons, including small caliber bullets, fuel-air explosives, high-velocity flechettes, cluster munitions and, most recently, lethal autonomous weapons.¹⁷⁶

F. Non-detectable Fragments

The first of the three original CCW protocols addressed to a specific conventional weapon, the Protocol on Non-detectable Fragments states in its entirety, “It is prohibited to use any weapon the primary effect of which is to injure by fragments which in the human body escape detection by X-rays.”¹⁷⁷ The *de minimus* costs to military advantage and the humanitarian benefits of banning a weapon have perhaps never been so obvious as with respect to non-detectable fragments. Non-detectable fragments, such as glass, greatly frustrate established medical protocols for treatment of trau-

174. Parks, *Weapons Reviews*, *supra* note 9, at 104.

175. Review Conference of the States 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, *Final Document*, Conf. Doc. CCW/CONF.I/16 (Part I), at 38 (1996).

176. Efforts to regulate lethal autonomous weapons through the CCW process is only in early stages. The United States has reacted especially cautiously to such efforts. See Michael W. Meier, U.S. Department of State, U.S. Opening Statement at the CCW Informal Meeting of Experts on Lethal Autonomous Weapons Systems, Apr. 13, 2015, <https://geneva.usmission.gov/2015/04/15/u-s-opening-statement-at-the-ccw-informal-meeting-of-experts-on-lethal-autonomous-weapons-systems/>. Regarding cluster munitions and the negotiation of a convention regulating their use outside the CCW review process, see *infra* text supported by note 246.

177. Protocol [I to the Convention on Prohibitions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects] on Non-Detectable Fragments, Oct. 10, 1980, 1342 U.N.T.S. 168.

ma wounds, requiring invasive exploratory surgery to locate and treat. In this respect, non-detectable fragments continue to inflict additional wounds and suffering even after the victim has been rendered *hors de combat*, evacuated from the battlefield and begun medical treatment. Few weapons seem so clearly to inflict unnecessary suffering as non-detectable fragments, although CCW Protocol I does not explicitly memorialize a conclusion to this effect.

Accounts of the CCW process do not record significant disagreement or difficulties achieving consensus with respect to the non-detectable fragments ban. The Protocol has 115 State parties, many of whom are militarily significant, and appears to enjoy a relatively successful record of implementation and observance.¹⁷⁸ Non-detectable fragments are not known to have ever been widely deployed, nor do they offer unique or novel military advantage.

G. Landmines

The CCW process also presented States an opportunity to address the humanitarian plague of landmines.¹⁷⁹ In addition to their unintended effects on civilians, landmines initially offended senses of military honor by their reliance on surprise, deception and, most characteristically, victim activation rather than direct confrontation.¹⁸⁰ It is well known that mines have produced tragic and widespread casualties among civilian populations, especially during and after conflicts involving their indiscriminate use. Mines have also produced particularly gruesome wounds, requiring amputations of lower limbs and inflicting heinous wounds to the genital and abdomen

178. *States Parties and Signatories*, UNOG, [http://www.unog.ch/__80256ee600585943.nsf/\(httpPages\)/3ce7cfc0aa4a7548c12571c00039cb0c?OpenDocument&ExpandSection=1#_Section1](http://www.unog.ch/__80256ee600585943.nsf/(httpPages)/3ce7cfc0aa4a7548c12571c00039cb0c?OpenDocument&ExpandSection=1#_Section1) (last visited July 29, 2015).

179. Unmarked minefields present significant obstacles to societies recovering from the effects of armed conflict. See GILLESPIE, *supra* note 76, at 60 n.218–40 (showcasing over forty Security Council resolutions noting negative effects of landmines in war-torn countries).

180. See STUART MASLEN, *ANTI-PERSONNEL MINES UNDER HUMANITARIAN LAW: A VIEW FROM THE VANISHING POINT 5* (2001) (citing MILTON F. PERRY, *INFERNAL MACHINES: THE STORY OF CONFEDERATE SUBMARINE AND MINE WARFARE 22* (1985)); Baxter, *supra* note 139, at 44, 48 (noting a treacherous conception of mines, however, more so with respect to civilians than against military personnel).

areas. Furthermore, mine wounds are known to exact a high mortality rate and when not fatal often result in permanent disability.¹⁸¹

The first militarily significant use of anti-personnel landmines as the term is understood today dates to the American Civil War. The Confederate Army is reported to have altered artillery shells to explode by being stepped on.¹⁸² Estimates indicate that both sides deployed fewer than 20,000 mines. Yet, one hundred years after the conflict, Civil War-era mines were discovered in a live condition in the American South.¹⁸³ Mine warfare proliferated greatly during the Second World War, with deployments numbering in the hundreds of millions.¹⁸⁴ The Korean and Vietnam conflicts also involved significant use of mines, with the United States making use of remotely-delivered mines scattered by aircraft or projectiles in the latter conflict.¹⁸⁵ Accurate estimates of the number of uncleared landmines have proved somewhat elusive. Studies motivated by political and financial goals have been proved to include drastic overestimations.¹⁸⁶ Yet reports of casualties from mines are irrefutably grave, with reliable annual estimates running to more than ten thousand.¹⁸⁷

Interestingly, responsible military doctrine considers landmines primarily as a means of countermobility operations, as opposed to casualty generators. In tactical and operational terms, mines are most effective when deployed to prevent or slow enemy maneuver rather than to directly generate casualties or achieve general attrition, although they have frequently been used simply to harass enemy activity, especially by irregular forces.¹⁸⁸ For

181. JOENNIEMI & ROSAS, *supra* note 36, at 60.

182. MASLEN, *supra* note 180, at 4–5 (citing MIKE CROLL, THE HISTORY OF LANDMINES 16–17 (1998)).

183. *Id.* at 5.

184. *Id.* at 6 (citing UNITED STATES DEFENSE INTELLIGENCE AGENCY & UNITED STATES ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER, LANDMINE WARFARE—TRENDS AND PREDICTIONS 2-1 (1992)).

185. MASLEN, *supra* note 180, at 8.

186. *See id.* at 19–22 (providing critiques of various overestimations of uncleared mines).

187. *Id.* *See also* Landmine Monitor, LANDMINE & CLUSTER MUNITION MONITOR, available at <http://www.the-monitor.org/index.php/LM/Our-Research-Products/Landmine-Monitor> (last visited Aug. 8, 2015) (posting annual reports on landmine situations, including individual country profiles).

188. HEADQUARTERS, DEPARTMENT OF THE ARMY, FM 5-102, COUNTERMOBILITY 80, 84 (1985) [hereinafter FM 5-102] (noting “mines are the most effective means of reinforcing the terrain to stop, slow, or channelize the enemy into areas where he can be killed”).

instance, landmines (anti-vehicle mines in particular) can be used to channelize enemy forces into direct fire engagement areas or to slow their progress through such zones, providing greater opportunities for defenders to fire on targets.¹⁸⁹ Refined military doctrine instructs forces to watch over mines to inflict direct-fire casualties or by calling for indirect fire, such as artillery or mortars, against enemy forces blocked or slowed by attempts to breach the minefield.¹⁹⁰ Additionally, by slowing enemy advance and increasing advancing forces' exposure time in engagement areas, landmines can greatly reduce the number of defenders required to hold a broad front.

Initial thoughts concerning regulation considered development of international marking requirements for minefields. Obligations to post signs or symbols and a duty to hand over maps indicating locations of mines were considered at various times in the history of efforts to regulate them.¹⁹¹ Although the original CCW diplomatic conference considered the possibility of a ban on anti-personnel landmines, States were unable to achieve any sort of consensus on this point.¹⁹² Other regulatory efforts sought to limit means of landmine dispersal. A 1974 proposal considered banning air delivery of mines to reduce indiscriminate effects, and discussions included rocket or missile delivery as well.¹⁹³

Rather than ban anti-personnel landmines, the CCW process produced two instruments regulating their use. The first was Protocol II on the Use of Mines, Booby Traps and Other Devices.¹⁹⁴ According to reports, draft-

189. Studies that acknowledge the military value of anti-vehicle mines have questioned the tactical value of anti-personnel mines, noting costs in terms of casualties, loss of flexibility and loss of support of indigenous populations. INTERNATIONAL COMMITTEE OF THE RED CROSS, ANTI-PERSONNEL LANDMINES: FRIEND OR FOE: A STUDY OF THE MILITARY USE AND EFFECTIVENESS OF ANTI-PERSONNEL MINES 71–72 (1996) [hereinafter ICRC, FRIEND OR FOE].

190. FM 5-102, *supra* note 188, at 84.

191. See INTERNATIONAL COMMITTEE OF THE RED CROSS, DRAFT RULES FOR THE LIMITATION OF THE DANGERS INCURRED BY THE CIVILIAN POPULATION IN TIME OF WAR art. 15 (2d ed. 1958) [hereinafter ICRC 1956 DRAFT RULES]. See also JOENNIEMI & ROSAS, *supra* note 36, at 57 (noting, however, that by 1975 no precise proposals for international marking requirements existed).

192. Burriss M. Carnahan, *The Law of Land Mine Warfare: Protocol II to the United Nations Convention on Certain Conventional Weapons*, 105 MILITARY LAW REVIEW 73, 74 (1984) (describing it as agreement to devise limitations rather than a prohibition on mines).

193. JOENNIEMI & ROSAS, *supra* note 36, at 58 (citing 1974 unidentified working paper).

194. Protocol [II to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to

ing of CCW Protocol II proved non-contentious.¹⁹⁵ Rather than resort to purely humanitarian innovations, the Protocol's requirements derived largely from emerging military doctrine requiring marking and recording of minefields.¹⁹⁶ The majority of the Protocol's substantive provisions address indiscriminate deployment of mines and it includes a number of prohibitions and precautions intended to spare civilians from the effects of mine operations.¹⁹⁷ For example, the Protocol greatly limits placement of mines in or near areas populated by civilians.¹⁹⁸ It also requires that the locations of remotely delivered mines be recorded and that they include neutralizing devices to render them harmless or destroy them when they no longer serve a military purpose.¹⁹⁹

The Protocol also regulates booby traps, which include "an apparently harmless portable object which is specifically designed and constructed to contain explosive material and to detonate when it is disturbed or approached."²⁰⁰ As a supplement to existing rules on perfidy and treachery, the Protocol forbids placement of booby traps among protected symbols and facilities such as medical installations, or associating booby traps with items routinely required by the civilian population such as food, children's items and religious objects.²⁰¹ Finally, States included elaborate recording requirements for minefields and booby traps and a duty to remove minefields "after the cessation of active hostilities."²⁰²

Preparatory meetings to generate updates and amendments to CCW Protocol II began in Geneva in 1994, with a formal CCW Article 8 Review Conference held in Vienna in 1995 and another in 1996. These ultimately produced Amended CCW Protocol II, which expanded CCW application to non-international armed conflicts, addressed remotely-delivered mines in greater detail, provided for detectability standards, and added provisions

Have Indiscriminate Effects] on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices, Oct. 10, 1980, 1342 U.N.T.S. 168 [hereinafter CCW Protocol II].

195. Parks, *Weapons Reviews*, *supra* note 9, at 77.

196. *Id.*

197. CCW Protocol II, *supra* note 194, arts. 2–3.

198. *Id.*, art 4.

199. *Id.*, art. 5.

200. *Id.*, art. 6(a).

201. *Id.*, art. 6.

202. *Id.*, arts. 7–9.

addressing anti-handling devices affixed to mines and self-deactivation requirements.²⁰³

Despite their success in generating amendments, the 1995 and 1996 Review Conferences competed for attention and adherents with a simultaneous effort to ban landmines altogether led by the International Campaign to Ban Landmines, a network of NGOs formed in 1992.²⁰⁴ The effort, supported also by the ICRC and a number of States, drew heavily on perceptions of public conscience against landmines, especially against their effects on civilian populations. In 1996, the Canadian government hosted a conference in Ottawa beginning a process to ban anti-personnel mines through a treaty. The effort culminated at an Oslo meeting where States produced the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and on Their Destruction,²⁰⁵ which was later signed by 122 States in Ottawa in December 1997. The Convention now has 162 State parties.²⁰⁶ A number of militarily significant States, however, have not ratified or acceded to the Convention, including China, India, Iran, North Korea, Pakistan, Russia, South Korea and the United States.

The Ottawa Convention represents one of the most thorough weapons regulations ever devised by States. Parties to the Convention have agreed not only to refrain from using landmines, but also never to “develop, produce, otherwise acquire, stockpile, retain or transfer to anyone, directly or indirectly, anti-personnel mines.”²⁰⁷ The Convention also addresses parties’ interactions with other States’ military operations by forbidding parties to

203. Protocol [II amended 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] on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices as amended on May 3, 1996, 2048 U.N.T.S. 133.

204. *Timeline of the International Campaign to Ban Landmines*, INTERNATIONAL CAMPAIGN TO BAN LANDMINES, http://www.icbl.org/media/916929/icb009_chronology_a5_v4-pages.pdf (last visited July 29, 2015).

205. Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and on Their Destruction, Sept. 18, 1997, 2056 U.N.T.S. 211 [hereinafter 1997 Ottawa Convention].

206. *Chapter XXVI Disarmament, Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and their Destruction*, UNITED NATIONS TREATY COLLECTION, https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-5&chapter=26&lang=en (last visited July 29, 2015).

207. 1997 Ottawa Convention, *supra* note 205, art 1.

“assist, encourage, or induce, in any way, anyone to engage in any activity prohibited to a State Party under [the] Convention.”²⁰⁸

Efforts to regulate and to prohibit anti-personnel mines have been complicated, implicating nearly the full range of humanitarian and other considerations that have informed law of war regulation of weapons. Existing landmine provisions appear to manifest consideration of all three principles of the law of war, as well as taking into account considerable negative public opinion, stigma and notoriety. While certainly symbolic advances for the effort to expand law of war treatment of specific weapons, on deeper reflection, the CCW Protocols on mines (in contrast to the Ottawa Convention) seem to add very little that scrupulous adherence to the general law of war principle of discrimination would not already have achieved. Despite seemingly legitimate claims concerning their military effectiveness and wide deployment, States committed to preserving the lawfulness of anti-personnel landmines seem increasingly tolerant of limits on their resort to them, if only as a matter of policy.²⁰⁹

H. Incendiary Weapons

The military value and effectiveness of incendiaries has been deeply debated. They have been used with great effect on entrenched troops, especially against determined defenders in bunkers, caves and other fortifications. Flamethrowers and other projecting incendiary weapons can reach around confined corners and through obstacles or openings in ways that few other weapons can.

The chief characteristic of incendiaries, however, may be their psychological effect.²¹⁰ Burn wounds produce severe pain and require intensive medical care to treat. Death from burns may occur long after wound infliction. Some types of incendiaries, such as napalm, produce more serious burns than others. In addition to burns, other incendiaries, such as white

208. *Id.*

209. In 2014, the United States announced at the Third Review Conference of the Ottawa Convention, that it would no longer produce or acquire anti-personnel landmines. Press Release, The White House, Office of the Press Secretary, Fact Sheet: Changes to U.S. Anti-Personnel Landmine Policy (June 27, 2014), <https://www.whitehouse.gov/the-press-office/2014/06/27/fact-sheet-changes-us-anti-personnel-landmine-policy>; Jim Garamore, *U.S. Announces Changes to Landmine Policy*, U.S. DEPARTMENT OF DEFENSE (June 27, 2014), <http://www.defense.gov/news/newsarticle.aspx?id=122562>.

210. JOENNIEMI & ROSAS, *supra* note 36, at 46.

phosphorous, introduce toxins and consume sufficient oxygen in confined spaces to result in asphyxiation.²¹¹

Given their grave capacity to injure, it is not surprising that weapons law history is replete with efforts to regulate incendiary weapons. At the 1932–34 League of Nations Disarmament Conference, the United Kingdom proposed a draft convention to forbid the use, production and stockpiling of incendiary weapons, including flamethrowers.²¹² The proposal reportedly attracted universal support among the States represented, however, the ban never entered force after the general failure of the Conference.

The widespread destruction and human suffering caused by use of incendiary bombs during the Second World War and especially the use of napalm in later conflicts ultimately inspired renewed attention. A 1956 ICRC proposal even classified incendiaries alongside nuclear, chemical and bacteriological agents as weapons whose effects could not be controlled sufficiently to protect civilian populations.²¹³ Attention to incendiaries became quite intense by the early 1970s with a significant number of States advocating a ban on their use, especially in anti-personnel engagements.²¹⁴

States finally addressed the use of incendiaries in Protocol III to the 1980 CCW. As with anti-personnel landmines, some States and organizations sought to ban the use of incendiaries, yet Protocol III merely restricts their use. Article 2(2) provides, “It is prohibited in all circumstances to make any military objective within a concentration of civilians the object of attack by air-delivered incendiary weapons.”²¹⁵ Article 2(3) addresses use of

211. *Id.* at 46.

212. *Id.* at 5, 46.

213. ICRC 1956 DRAFT RULES, *supra* note 191, art. 14.

214. Parks, *Weapons Reviews*, *supra* note 9, at 78. *See also* G.A. Res. 3255A, U.N. Doc. A/RES/3255 (XXIX) (Dec. 9, 1974); G.A. Res. 3255B, U.N. Doc. A/RES/3255 (XXIX) (Dec. 9, 1974); G.A. Res. 3076 (XXVIII), U.N. Doc. A/RES/3076 (XXVIII) (Dec. 6, 1973); G.A. Res. 2932A, U.N. Doc. A/RES/2932 (XXVII) (Nov. 29, 1972) (recording the General Assembly “deplores the use of napalm and other incendiary weapons in all armed conflicts”); G.A. Res. 2852, U.N. Doc. A/RES/2852 (XXVI) (Dec. 20, 1971); U.N. Secretary-General, *Respect for Human Rights in Armed Conflicts*, ¶ 126, U.N. Doc. A/8052 (Sept. 18, 1970) (asking the General Assembly to consider requesting the Secretary-General to prepare a report on napalm); U.N. Secretary-General, *Respect for Human Rights in Armed Conflicts*, ¶ 200, U.N. Doc. A/7720 (Nov. 20, 1969) (suggesting a legal study on napalm be undertaken); Tehran Conference Final Act, *supra* note 166 (addressing napalm).

215. Protocol [III 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] on Prohibitions or Restrictions on the Use of Incendiary Weapons art. 2(2), Oct. 10, 1980, 1342 U.N.T.S. 171.

incendiaries delivered by means other than air, prohibiting their use against military objectives except when they are “clearly separated” from concentrations of civilians and when precautions are taken to protect civilians and civilian objects from the effects of their use.²¹⁶

Examination of Protocol III’s substantive limits demonstrates that the Protocol is best understood as a manifestation and refinement of the principle of discrimination rather than of unnecessary suffering. Civilians, rather than combatants, appear to be the primary beneficiaries of the Protocol. Had it been intended to address unnecessary suffering, one would have expected provisions limiting or even prohibiting incendiary use against combatants. That the Protocol includes no such limits leaves the law of war principle of unnecessary suffering itself the only limit on their use against combatants, greatly undermining arguments that incendiary use involves unnecessary suffering per se. While undoubtedly an improvement in general humanitarian terms, the Protocol is evidence of States’ view of the continued military effectiveness of incendiaries despite strong medical evidence of inflicting high degrees of human suffering and their seemingly reduced deployment.

I. *Blinding Lasers*

At the First CCW Review Conference, convened nearly fifteen years after the base CCW treaty and first three protocols were completed, the CCW parties added a protocol to ban blinding lasers. Protocol IV prohibits use and transfer of “laser weapons specifically designed, as their sole combat function or as one of their combat functions, to cause permanent blindness to unenhanced vision”²¹⁷ The Blinding Lasers Protocol is a rare instance of States agreeing to ban a weapon in advance of its deployment.²¹⁸

There are 104 State parties to the Protocol, including a high number of militarily significant States. Consent to be bound by the Protocol progressed somewhat slowly after its entry into force in 1998. Nearly a third of the current State parties joined the Protocol more than five years after

216. *Id.*, art. 2(3).

217. 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] on Blinding Laser Weapons art. 1, Oct. 13, 1995, 1380 U.N.T.S. 370. [hereinafter 1980 CCW Protocol IV]

218. DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 517.

that.²¹⁹ Militarily significant States not party to Protocol IV include Afghanistan, Algeria, Central African Republic, Democratic People's Republic of Korea, Democratic Republic of Congo, Egypt, Ethiopia, Indonesia, Iran, Jordan, Lebanon, Nigeria, Republic of Korea, Singapore, Sudan, Syria, Uganda, United Arab Emirates and Venezuela.²²⁰

Like its predecessor concerning non-detectable fragments, the Blinding Lasers Protocol is by modern standards an exceedingly brief and seemingly unambiguous law of war instrument.²²¹ Its brevity and clarity mask, however, the somewhat contested nature of its development and adoption. Efforts to regulate or ban blinding lasers actually preceded the CCW review conferences by more than two decades.²²² At the original CCW proceedings, States rejected a ban on blinding lasers proposed by Sweden.²²³ Resistance to the ban stemmed from disagreement whether blinding by laser inflicted unnecessary suffering, and fear that a ban on blinding lasers might impact other laser use on the modern battlefield,²²⁴ which includes target designation, range finding and even destructive functions.²²⁵

By the mid-to-late 1980s States and international organizations harbored sufficient concern regarding the blinding effects of lasers to provoke a series of ICRC and UN conferences to reinvestigate the feasibility of in-

219. *Treaties Database, Status of the Protocol*, UNODA, http://disarmament.un.org/treaties/t/ccwc_p4 (last visited July 29, 2015).

220. *Id.*

221. 1980 CCW Protocol IV, *supra* note 217. The Protocol's brevity is due in significant part to its reliance on the administrative provisions of its base treaty, the 1980 Convention on Certain Conventional Weapons. *See* 1980 CCW, *supra* note 171.

222. W. Hayes Parks, *Memorandum of Law: Travaux Préparatoires and Legal Analysis of Blinding Laser Weapons Protocol*, reprinted in *THE ARMY LAWYER*, June 1997, at 33, 33.

223. *Id.*

224. *Id.* *See also* Ann Peters, *Blinding Laser Weapons: New Limits on the Technology of Warfare*, 18 *LOYOLA OF LOS ANGELES INTERNATIONAL & COMPARATIVE LAW JOURNAL* 733, 734 (1995) (reporting that the United States "strenuously resisted" international regulation of lasers until 1995).

225. *See* Julian E. Barnes, *Navy Tests Laser Weapon on Drones, Boats*, *WALL STREET JOURNAL* (Dec. 9, 2014), <http://www.wsj.com/articles/navy-tests-laser-weapon-on-drones-boats-1418182202>; Ben Farmer, *US Navy Testing New Drone Killing Laser Weapon in Gulf*, *TELEGRAPH* (Nov. 25, 2014), <http://www.telegraph.co.uk/news/worldnews/north-america/usa/11253505/US-Navy-testing-new-drone-killing-laser-weapon-in-Gulf.html>.

See generally Burrus M. Carhanan, *Unnecessary Suffering, the Red Cross and Tactical Laser Weapons*, 18 *LOYOLA OF LOS ANGELES INTERNATIONAL & COMPARATIVE LAW JOURNAL* 705 (1995) (emphasizing the military potential of anti-optic and dazzling lasers).

ternational regulation.²²⁶ Some studies emphasized the gruesome physical process by which lasers inflict blindness. Laser damage to eyes can reportedly occur by vaporizing water in eye tissue into steam, by heating tissue to temperatures sufficient to cook the eye or even by generating plasma that harnesses sufficient energy to induce an explosion in the eye.²²⁷ Not all considerations leading to the conclusion that blinding lasers caused unnecessary suffering related to physical injury. One account of a blinding by laser is particularly repugnant and relates well the potential for psychological suffering: “When the beam struck my eye, I heard a distinct popping sound caused by a laser-induced explosion at the back of my eyeball. My vision was obscured almost immediately by streams of blood.”²²⁸ Studies also emphasized “a devastating and immediate effect on military morale” from blinding lasers.²²⁹ Eyesight is regarded as the most important of human senses, a finding buttressed by instinctive human reactions to protect the eyes during traumatic events and crises.²³⁰ Still other studies suggested that long-term and permanent blindness inflict severe, life-long psychological suffering.²³¹ Similar studies expressed great concern for the social costs of supporting blinded war veterans.²³²

Considering the total ban on combat use of blinding lasers, as opposed to mere limitations on use, it may not be too great a stretch to conclude that a determination regarding unnecessary suffering motivated many States’ support for the Protocol. Some might go so far as to conclude blinding laser use constitutes unnecessary suffering per se.

226. See generally INTERNATIONAL COMMITTEE OF THE RED CROSS, *BLINDING WEAPONS: REPORTS OF THE MEETINGS OF EXPERTS CONVENED BY THE ICRC ON BATTLEFIELD LASER WEAPONS 1989–1991* (Louise Doswald-Beck ed., 1993) [hereinafter ICRC, *BLINDING WEAPONS*].

227. Bengt Anderberg, Ove E. Bring & Myron L Wolbarsht, *Blinding Laser Weapons and International Humanitarian Law*, 29 *JOURNAL OF PEACE RESEARCH* 287, 290–91 (1992).

228. Jack H. McCall Jr., *Blinded by the Light: International Law and the Legality of Anti-Optic Laser Weapons*, 30 *CORNELL INTERNATIONAL LAW JOURNAL* 1 (1997) (quoting a recounting of a researcher’s accidental blinding by a laboratory laser in William Arkin, *Ban Tactical Laser Weapons: DoD Maintains Blinding is Not Violation of War*, *DEFENSE NEWS*, July 17–23, 1995, at 20).

229. McCall, *supra* note 228, at 291.

230. *Id.* at 294.

231. R. DeVour, *Possible Psychological and Societal Effects of Sudden Permanent Blindness of Military Personnel Caused by Battlefield Use of Laser Weapons*, in ICRC, *BLINDING WEAPONS*, *supra* note 226, at 46, 47.

232. D. Warren, *Psychological Effects of Total Permanent Blindness Occurring in Early Adulthood*, in ICRC, *BLINDING WEAPONS*, *supra* note 226, at 50.

While the record indicates a contentious process of negotiation, it is possible that on careful consideration States concluded that lasers designed and employed specifically to blind do not offer sufficient military advantage to justify the documented suffering and social costs of their effects on humans. In this regard, as a line-of-sight, direct-fire weapon, lasers do not seem to offer significant military advantage, novel access to enemy vulnerabilities or effectiveness greater than other direct-fire weapons. It is true that lasers are much less, if at all, susceptible to trajectory effects from gravity and environmental considerations such as wind, temperature and humidity. However, unlike incendiaries, their battlefield use did not seem to offer access to targets that could not be reached effectively by other means. That medical science offers no cure or treatment to restore the damage caused by blinding lasers likely contributed to their ultimate regulation tolerance. Success at concluding the Protocol is also likely attributable to negotiators' success at devising language to permit use of lasers for other purposes, such as range finding and target designation.

J. Cluster Munitions

The most surprising aspect of cluster munitions may not be the rapidly increasing pace at which they are regulated nor their remarkable engineering, but rather their relatively early appearance on the battlefield. Generally identified as munitions that disperse multiple independent, explosive submunitions, cluster munitions featured in fifteenth century design drawings of Leonardo da Vinci.²³³ They were reportedly first used by Sweden in 1840, in the form of mortars that scattered exploding grenades.²³⁴ By the twentieth century, British scientists developed cluster munitions intended to facilitate incendiary attacks during the First World War.²³⁵ Their first widespread use was by German and Soviet forces in the Second World War against urban targets and armored forces, respectively.²³⁶ Later in the war, the United States used cluster munitions with incendiary submunitions

233. Virgil Wiebe, John Borrie & Declan Smyth, *Introduction* to THE CONVENTION ON CLUSTER MUNITIONS: A COMMENTARY 1 (Gro Nystuen & Stuart Casey-Maslen eds., 2010) (citing MARCO CIANCHI, LEONARDO DA VINCI'S MACHINES 31(1988)).

234. GILLESPIE, *supra* note 76, at 65.

235. See ERIC PROKOSCH, THE TECHNOLOGY OF KILLING: A MILITARY AND POLITICAL HISTORY OF ANTIPERSONNEL WEAPONS 82 (1995).

236. GILLESPIE, *supra* note 76, at 65.

against Japanese cities.²³⁷ Since those pioneering uses, it is estimated cluster munitions have been used in at least thirty-three other armed conflicts.²³⁸

Military doctrine recognizes that cluster munitions offer a number of important advantages in combat. Cluster munitions, especially those that are air-delivered, minimize risks to friendly forces by reducing the number of sorties required to apply ordnance to large military objectives.²³⁹ A single cluster munition, through dispersal of multiple submunitions, can cover an area comparable to that of dozens (or more) conventional, fragmenting munitions. The dispersed effects of submunitions are also effective against moving targets. Rather than strike the actual intended target or very near it, cluster munitions need only strike the general area through which a mobile target is moving. Cluster munitions have also proved particularly effective against anti-aircraft arrays, permitting pilots to avoid dangerous, low-level bombing runs required to accurately employ single-blast unguided bombs.²⁴⁰

Concern for humanitarian costs of cluster munitions emerged soon after their proliferation. Active efforts to regulate or ban cluster munitions intensified after the United States used them extensively in the Vietnam War.²⁴¹ High dud rates and the propensity of unexploded submunitions to attract attention from children led to calls to regulate cluster munitions in the early 1970s.²⁴² Civilian casualty figures resulting from indiscriminate use

237. PROKOSCH, *supra* note 235, at 82.

238. GILLESPIE, *supra* note 76, at 65.

239. THE JUDGE ADVOCATE GENERAL'S SCHOOL, U.S. AIR FORCE, AIR FORCE OPERATIONS AND THE LAW 296 (2002).

240. PROKOSCH, *supra* note 235, at 83–84.

241. GILLESPIE, *supra* note 76, at 65. Gillespie estimates the United States dropped as many as 285 million submunitions during the Vietnam War. *Id.* at 66. Human Rights Watch reports a significantly greater amount, estimating the United States dropped nearly 400 million submunitions on Cambodia, Laos and Vietnam. HUMAN RIGHTS WATCH, MEETING THE CHALLENGE: PROTECTING CIVILIANS THROUGH THE CONVENTION ON CLUSTER MUNITIONS 7, 10–11 (Nov. 2010), available at <https://www.hrw.org/sites/default/files/reports/armsclusters1110webwcover.pdf>. See also Michael Krepon, *Weapons Potentially Inhumane: The Case of Cluster Bombs*, 52 FOREIGN AFFAIRS 595, 603–4 (Apr. 1974) (describing extensive U.S. use of cluster munitions in northern Vietnam).

242. William H. Boothby, *Cluster Bombs: Is There a Case for New Law?*, 5 HARVARD UNIVERSITY PROGRAM ON HUMANITARIAN POLICY AND CONFLICT RESEARCH, OCCASIONAL PAPER 14 (2005) [hereinafter Boothby, *Cluster Bombs*] (relating data on cluster munition dud rates between 5 and 20–30 percent); HUMAN RIGHTS WATCH, FATALLY FLAWED: CLUSTER BOMBS AND THEIR USE BY THE UNITED STATES IN AFGHANISTAN (2002), available at <http://www.hrw.org/reports/2002/us-afghanistan/Afghan1202.pdf> [hereinafter FATALLY FLAWED].

of cluster munitions and the work of NGOs generated significant negative opinion, similar to the campaign against anti-personnel landmines.²⁴³ It is believed that Israel's 2006 use of as many as 4.6 million submunitions against Hezbollah in southern Lebanon, resulting in perhaps 265 civilian deaths between 2006 and 2009 from those that failed to explode, proved a crucial tipping point in international efforts to ban cluster munitions.²⁴⁴

By 1990, firm proposals to ban cluster munition use or to place strict regulations on acceptable dud rates circulated among several States.²⁴⁵ A number of States and NGOs later exercised the CCW Article 8 review process to address humanitarian concerns associated with cluster munitions.²⁴⁶ At a series of meetings and conferences, including periodic CCW review conferences, State parties made a number of important determinations with respect to regulation of cluster munitions.²⁴⁷ First, the CCW States resolved not to address cluster munitions as such, but rather through Protocol V regulations on unexploded ordnance in general.²⁴⁸ Second, States rejected a

243. *NATO's Use of Cluster Munitions in Yugoslavia*, HUMAN RIGHTS WATCH (1999), <http://www.hrw.org/reports/1999/05/11/natos-use-cluster-munitions-yugoslavia>. The report, in fact, equates unexploded cluster bomb submunitions with anti-personnel landmines, a conclusion rejected by the Office of the Prosecutor of the International Criminal Tribunal for the former Yugoslavia. *Id.*; International Criminal Tribunal for the former Yugoslavia, Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia, ¶ 27, available at <http://www.icty.org/x/file/Press/nato061300.pdf> (last visited June 29, 2015). See also Thomas Herthel, *On the Chopping Block: Cluster Munitions and the Law of War*, 51 AIR FORCE LAW REVIEW 229 (2001) (rebutting arguments equating cluster munitions with anti-personnel landmines).

244. Wiebe, Borrie & Smyth, *supra* note 233, at 10–11, 15.

245. GILLESPIE, *supra* note 76, at 67. The earliest State proposal to ban cluster munitions may have been a 1974 Swedish proposal to prohibit “cluster warheads” submitted to the drafting conference that prepared Additional Protocols I and II to the 1949 Geneva Conventions. See Wiebe, Borrie & Smyth, *supra* note 233, at 12 (citing *Working Paper submitted by Egypt, Mexico, Norway, Sudan, Sweden, Switzerland, and Yugoslavia to the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts*, Doc. CDDH/DT/2 (Feb. 21, 1974)).

246. See Louis Maresca, *A New Protocol on Explosive Remnants of War: The History and Negotiation of Protocol V to the 1980 Convention on Certain Conventional Weapons*, 86 INTERNATIONAL REVIEW OF THE RED CROSS 815, 817–22 (2004) (recounting meetings that led to production of Protocol V to the CCW).

247. See David Kaye & Steven A. Solomon, *The Second Review Conference of the 1980 Convention on Certain Conventional Weapons*, 96 AMERICAN JOURNAL OF INTERNATIONAL LAW 922 (2002).

248. Protocol [V to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to

number of NGO calls for CCW bans and moratoriums on use of cluster munitions in favor of regulations governing technical features and duties with respect to post-combat removal of ordnance.²⁴⁹ Specifically, States rejected calls to ban use of cluster bombs against military objectives located in concentrations of civilians, a provision similar to that included in the preceding CCW Protocol III on incendiaries.²⁵⁰

Meetings convened since 2003 have considered means to further limit or condition use of cluster munitions, but have not yet secured consensus for any amendment to Protocol V nor have they worked toward a CCW ban on cluster munitions as some had hoped. At the Third CCW Review Conference, twenty-six States supported a CCW protocol addressed specifically to cluster munitions, however, their proposal failed.²⁵¹ Norway, dissatisfied with Protocol V, to the surprise of many participants in the CCW process proposed an international ban on cluster munitions separate from the CCW regime near the end of the 2006 CCW Third Review Conference.²⁵² The Oslo Process ultimately produced the Convention on Cluster Munitions (CCM) concluded in 2008.²⁵³ Unlike the CCW process, the procedures used to develop the CCM did not require absolute consensus, though rules of procedure strongly encouraged pursuit of consensus over the alternative two-thirds majority rule.²⁵⁴

The CCM prohibits parties to “[u]se . . . , [d]evelop, produce, otherwise acquire, stockpile, retain or transfer to anyone, directly or indirectly, cluster munitions.”²⁵⁵ Like the Ottawa Convention with respect to landmines, the CCM also regulates State parties’ actions with respect to military operations

Have Indiscriminate Effects] on Explosive Remnants of War, Nov. 28, 2003, 2399 U.N.T.S. 100.

249. Boothby, *Cluster Bombs*, *supra* note 242, at 15.

250. *Id.*

251. *Proposal for a Mandate to Negotiate a Legally-Binding Instrument that Addresses the Humanitarian Concerns Posed by Cluster Munitions*, Third Review Conference of States Parties to the CCW, Geneva, Doc. CCW/CONF.III/WP.1 (Oct. 25, 2006).

252. Wiebe, Borrie & Smyth, *supra* note 233, at 16.

253. Convention on Cluster Munitions, May 30, 2008, 2688 U.N.T.S. 39 [hereinafter 2008 CCM]. Norway has developed over time a reputation for pushing the humanitarian limits of the law of war. For instance, at the Diplomatic Convention for Additional Protocols I and II to the 1949 Geneva Conventions, Norway made a particularly radical proposal to eliminate the traditional legal distinction between international and non-international armed conflicts. *See* 1977 AP COMMENTARY, *supra* note 12, at 1328 & n.31.

254. Rules of Procedure, Dublin Diplomatic Conference r. 36 ¶ 1, Diplomatic Conference Doc. CCM/52 (May 19, 2008).

255. 2008 CCM, *supra* note 253, art. 1.

of allies not party to the Convention. CCM Parties may not “assist, encourage or induce anyone to engage in any activity prohibited to a State Party under [the] Convention.”²⁵⁶ Despite its quite comprehensive ban, the CCM includes an important provision on interoperability that proved essential to States’ acceptance of the Convention at its diplomatic conference in Dublin. Article 21(3) provides, “Notwithstanding the provisions of Article 1 of this Convention and in accordance with international law, States Parties, their military personnel or nations may engage in military cooperation and operations with States not party to this Convention that might engage in activities prohibited to a State Party.”

States have ratified or acceded to the CCM relatively rapidly in response to aggressive public campaigns designed to stigmatize the use of cluster munitions. There are already ninety-three States party to the CCM.²⁵⁷ The list of State parties includes strong representation among NATO members. Notable non-party States include China, Russia, India, Iran, Israel, Pakistan and the United States. The conclusion and entry into force of the CCM has likely reduced enthusiasm for pursuing a CCW ban on cluster munitions; however, a number of States possessing cluster munitions appeared interested in sustaining the CCW process as a means of regulation, perhaps to compete with the CCM.²⁵⁸ At present, their efforts have not met with success.²⁵⁹ Until these States experience significant changes of opinion with respect to the effectiveness of cluster munitions or a replacement emerges for these widely deployed weapons, however, both ratification of the CCM and negotiation of a CCW protocol seem unlikely.

K. *Flechettes*

In addition to provoking attention to incendiaries, cluster munitions and landmines, the Vietnam War sparked interest in regulating or banning flechette projectiles. After sporadic use in ancient warfare and their first significant use in the First World War, flechettes evolved by the mid-

256. *Id.*

257. *Chapter XXVO, Disarmament, Convention on Cluster Munitions*, UNITED NATIONS TREATY COLLECTION, https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtmsg_no=XXVI-6&chapter=26&lang=en (last visited July 29, 2015).

258. Wiebe, Borrie & Smyth, *supra* note 233, at 19.

259. Bonnie Docherty, *Ending Civilian Suffering: The Purpose, Provisions, and Promise of Humanitarian Disarmament Law*, 15 AUSTRIAN REVIEW OF INTERNATIONAL AND EUROPEAN LAW 7, 42–43 (2013) (noting that 50 States parties resisted and ultimately defeated a U.S.-led proposal to develop a CCW cluster munitions protocol in 2011).

twentieth century into small dart or nail-like projectiles usually launched in mass quantities by an explosive charge or shell.²⁶⁰ Designed for anti-personnel use, flechettes (or “beehive” rounds) were credited with the repulsion of a number of determined attacks against lightly defended firebases during the Vietnam War.²⁶¹ They have also, however, been condemned as indiscriminate and capable of inflicting unnecessary suffering on combatants. The possibility that flechettes may deform or fragment on impact led to the allegation that, like expanding bullets, they cause wounds greater than that necessary to incapacitate combatants.²⁶² Because of their small size, low weight and slim aerodynamic profile, flechettes travel at extraordinarily high speed. Injuries from shock waves produced by high-speed impact with human tissue inspired many early objections to the use of projectiles that travel at similarly high velocity.²⁶³ It was thought by some that these shock waves produced injury in excess of that needed to render targets *hors de combat*.

Despite these objections, efforts to ban or regulate flechettes have failed consistently. Efforts of the early 1970s met rejection reportedly because of the sparse use of flechettes. At the time, the United States was the only State to acknowledge that it had flechettes in its inventory and expressed “keen interest in retaining” them.²⁶⁴ Defenders of flechettes emphasized that any issue of indiscriminateness was attributable to improper use rather than to the nature of the projectiles themselves.²⁶⁵ Defenders also rejected conclusions that flechettes cause injuries more grave than other projectiles in common use.²⁶⁶

Interest in regulating flechettes decreased after these early attempts, with flechettes attracting only sporadic mention at weapons conferences, including the CCW process.²⁶⁷ Meanwhile, flechettes failed to demonstrate much staying power in the weapons inventories of major powers. Despite their apparent utility and effectiveness, the United States phased them out

260. Eric Prokosch, *Technology and Its Control: Antipersonnel Weapons*, 28 INTERNATIONAL SOCIAL SCIENCE JOURNAL 341, 344, 348–49 (1976), available at <http://unesdoc.unesco.org/images/0001/000197/019707eo.pdf#19712>.

261. EITAN BARAK, DEADLY METAL RAIN: THE LEGALITY OF FLECHETTE WEAPONS IN INTERNATIONAL LAW 45–47 (2011).

262. LUCERNE REPORT, *supra* note 8, ¶ 210, at 59.

263. *Id.*

264. BARAK, *supra* note 261, at 66.

265. *Id.* at 68.

266. *Id.* (citing LUCERNE REPORT, *supra* note 8, ¶ 215, at 61).

267. *Id.* at 75–85.

by the 1980s, most notably from its arsenal of tank rounds.²⁶⁸ It is likely that technical advances in cluster munitions account for the displacement of flechettes as favored anti-personnel weapons. At present, Israel appears to be the only major military power that acquires and employs flechettes in significant quantities.²⁶⁹

L. Chemical Weapons

Relative to efforts to regulate other weapons, enthusiasm for international regulation of chemical weapons emerged and became established early in their development.²⁷⁰ At the 1899 Hague Peace Conference, most States immediately perceived chemical weapons as substantially different from other weapons under consideration for regulation. Price has observed in addressing the agreement produced at the Conference, “The unique aspect of the emergent CW [chemical weapons] norm . . . is that it did not . . . simply ban particular uses of such shells (e.g. against civilians), while implicitly conferring legitimacy upon their use against soldiers in the field. Rather, the Hague declaration took the form of a more absolute prohibition . . .”²⁷¹

States’ early enthusiasm for regulation of chemical weapons is in one respect surprising, yet in another respect foreseeable. The surprising aspect of States’ early regulation of chemical weapons is their nascent state of development at the time. Chemical weapons, especially those delivered by projectile, were not widely fielded by the States which ratified the 1899 ban on their use. In fact, uncertainty as to their effects and military necessity led the United States to withhold support for the ban and subsequent regulation of chemical weapons for over five decades.

The foreseeable aspect of the early ban on chemical weapons relates to the inherent characteristics or nature of these weapons. Although the Hague conference attendees addressed them, and current law regards them as separate means subject to separate prohibitions, chemical weapons and

268. *Id.* at 49.

269. *Id.* at 3–4.

270. *But see* Jean Pascal Zanders, *International Norms against Chemical and Biological Warfare: An Ambiguous Legacy*, 8 JOURNAL OF CONFLICT AND SECURITY LAW 391, 400 (2003) (arguing that legal and social norms against chemical weapon use have never been straightforward, unambiguous or uncontested).

271. Price, *supra* note 93, at 90 (addressing Declaration (IV, 2) on the Use of Projectiles the Object of Which is the Diffusion of Asphyxiating or Deleterious Gases, July 29, 1899, 187 Consol. T.S. 453, 26 Martens Nouveau Recueil (ser. 2) 998).

poison elicit many of the same human reactions.²⁷² Defenders characterized early chemical attacks of the First World War as “poisonous.”²⁷³ Asserting similarities between poison and chemical weapons, Professor van Courtland Moon offers this observation from a World War I memoir:

You always felt this poison gas was so mean and treacherous. It wasn't so much the harm it did to the body, which was always much over-estimated in the popular imagination, as the harm it did to the mind. A shell might make terrible wounds, but its burst was all over in an instant. It was a case of hit or miss which left no ill-will behind. But this harmless-looking, almost invisible, stuff would lie for days on end lurking in low places waiting for the unwary. It was the Devil's breath. It was Ahrimanic from the first velvety phut of the shell burst to those corpse-like breaths that a man inhaled almost unawares. It lingered about out of control. When he fired it, man released an evil force that became free to bite friend or foe till such time as it died into the earth.²⁷⁴

Perceptions of chemical weapons also parallel poison in that they are characterized as a “weapon of the weak.”²⁷⁵ Often derided as “the poor man's bomb,” chemical weapons have been depicted as a crude and uncivilized alternative sought out by poor and technologically unsophisticated powers attempting to level the odds of combat with technically and militarily superior powers. Indeed, chemical weapons have been used often in conflicts between asymmetrically equipped forces.²⁷⁶ If poison was the weapon of choice for the disempowered seeking to displace powerful kings, chemical weapons represent a modern analog in their capacity to hamstring the most efficient and powerful armed forces.²⁷⁷

272. See *id.* at 80. But see Zanders, *supra* note 270, at 407–8 (emphasizing post-Hague, German and Allied distinctions between poisons and chemical weapons).

273. See van Courtland Moon, *supra* note 83, at 64 (quoting John French's Despatch of 15 June 1915. *Sir John French's Eighth Despatch*, THE LONG, LONG TRAIL, http://www.1914-1918.net/french_eighth_despatch.html).

274. van Courtland Moon, *supra* note 83, at 73 (quoting ARTHUR ALAN HANBURY-SPARROW, *THE LAND-LOCKED LAKE* 309–10 (1932)).

275. Price, *supra* note 93, at 98.

276. W. Hays Parks, *Classification of Chemical-Biological Warfare*, 13 UNIVERSITY OF TOLEDO LAW REVIEW 1165, 1166 (1982) [hereinafter Parks, *Chemical-Biological Warfare*] (citing Jack F. Calvert, *Chemical Weapons: Problems and Policy Formulations*, U.S. ARMY WAR COLLEGE, STRATEGIC STUDIES INSTITUTE RESEARCH MEMORANDUM 1-2 (1981)).

277. See Donald B. Headley, Gerald A. Hudgens & Donald Cunningham, *The Impact of Chemical Protective Clothing on Military Operational Performance*, 9 MILITARY PSYCHOLOGY 359, 359 (1997) (noting the chemical protective clothing limits “dexterity, mobility, command

Accounts of the effectiveness of the 1899 Hague Gas Declaration vary. The prevailing view regards the Declaration's ban on chemical weapons as a failure in light of widespread use of chemical shells by both sides in the First World War.²⁷⁸ Estimates indicate that belligerents fired as many as sixty-six million gas shells dispersing over 124,000 tons of chemical agents, affecting over one million soldiers.²⁷⁹ In fact, gas use in the First World War became so horrific that by 1918 it provoked an exceedingly rare public appeal from the ICRC.²⁸⁰

A more nuanced view, however, notes that both sides refrained from use for a considerable period of the war, likely due to the influence of the 1899 ban and the negative political discourse it provoked.²⁸¹ This refined view suggests a stronger political and human reluctance to resort to chemical weapons than the general military history of the First World War reveals.

Inspired by the horrors of First World War battlefields, States renewed efforts to regulate chemical weapons, first through the failed Washington Treaty of 1922²⁸² and later through the 1925 Geneva Gas Protocol.²⁸³ While the Washington agreement banned chemical warfare, the Washington con-

and control, communications, and endurance"); John L. Kobrick & Bernard J. Fine, *Effect of Heat and Chemical Clothing on Cognitive Performance*, 58 AVIATION, SPACE & ENVIRONMENTAL MEDICINE 149 (1983) (noting 17–23 percent increases in soldiers' cognitive errors after seven hours of heat exposure in chemical protective clothing).

278. ANN VAN WYNEN & A. J. THOMAS JR., LEGAL LIMITS ON THE USE OF CHEMICAL AND BIOLOGICAL WEAPONS 141 (1970).

279. See GILLESPIE, *supra* note 76, at 90 (citing ALAN KRAMER, DYNAMIC OF DESTRUCTION: CULTURE AND MASS KILLING IN THE FIRST WORLD WAR (2007)).

280. Rainer Baudendistel, *Force Versus Law: The International Committee of the Red Cross and Chemical Warfare in the Italo-Ethiopian War 1935–1936*, 80 INTERNATIONAL REVIEW OF THE RED CROSS 81, 94, 98 (1998). The ICRC maintains a policy of strict confidentiality. It keeps secret all information gathered from parties to conflicts during its humanitarian activities. Decisions to go public with information concerning breaches or to confront belligerents publicly with violations of the law of war have been exceptionally rare. The organization more commonly consults privately with parties to advocate compliance with international legal obligations. See International Committee of the Red Cross, *Policy Document, The International Committee of the Red Cross's (ICRC's) Confidential Approach: Specific Means Employed by the ICRC to Ensure Respect for the Law by State and non-State Authorities*, 94 INTERNATIONAL REVIEW OF THE RED CROSS 1135 (2012).

281. Price, *supra* note 93, at 91–92.

282. Submarines and Gases Treaty, *supra* note 154.

283. Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, June 17, 1925, 26 U.S.T. 571, 94 L.N.T.S. 65 [hereinafter 1925 Geneva Protocol].

ference did not manage to secure ratification of any of its work. However, just three years later under the League of Nations, negotiations implementing the Treaty of Versailles which ended the First World War²⁸⁴ produced the 1925 Geneva Gas Protocol, binding parties to ban “the use in war of all asphyxiating, poisonous, and other gases,” as well as “bacteriological methods of warfare.”²⁸⁵ Parties also stipulated that the prohibition was “universally accepted as a part of International Law, binding alike the conscience and the practice of nations.”²⁸⁶

Despite the apparent universal character of the chemical weapons taboo, major powers were willing to ratify the 1925 Gas Protocol only with significant reservations. The most important reservations limited the Protocol’s operation to conditions of reciprocal observance by other parties. The French government reservations are representative, providing:

The said Protocol is only binding on the Government of the French Republic as regards States which have signed or ratified it or which may accede to it.

The said Protocol shall *ipso facto* cease to be binding on the Government of the French Republic in regard to any enemy State whose armed forces or whose Allies fail to respect the prohibitions laid down in the Protocol.²⁸⁷

Notwithstanding States’ surprising and still-unexplained forbearance with respect to chemical weapons during the Second World War, the 1925 Geneva Gas Protocol and its customary law byproduct²⁸⁸ did not manage to stem resort to chemical weapons entirely.²⁸⁹ Substantiated allegations of their use have been made in the 1935 Italo-Abyssinian War, the 1937 Sino-Japanese War, the 1963 Yemeni War and, most notably, the 1980s Iran-

284. Treaty of Peace between the Allied and Associate Powers and Germany art. 171, June 28, 1919, 225 Consol. T.S. 188 (Versailles Treaty).

285. 1925 Geneva Protocol, *supra* note 283. See also Zanders, *supra* note 270, at 398 (discussing impact of the Versailles Treaty provisions on Germany’s chemical weapons).

286. 1925 Geneva Protocol, *supra* note 283, para. 3.

287. DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 165.

288. See ICRC CIL STUDY, *supra* note 11, r. 73, at 259.

289. Japan proved an exception to the Second World War belligerents’ restraint at employing chemical weapons. The Japanese Army used chemical artillery shells repeatedly during its invasion of China resulting in large-scale casualties among soldiers and civilians. See GILLESPIE, *supra* note 76, at 92.

Iraq War.²⁹⁰ The latter two episodes of gas use, like that of the First World War, provoked truly exceptional public appeals from the ICRC.²⁹¹ Still, among the hundreds of armed conflicts of the twentieth century, only six featured use of chemical weapons.²⁹²

In later developments, especially at the formative stages of the 1977 Additional Protocols to the 1949 Geneva Conventions, States' experts quickly rejected weapons of mass destruction from consideration.²⁹³ Interests of comity toward efforts already underway under UN auspices and a preference for promoting adoption and implementation of existing regulations such as the 1925 Gas Protocol seem to have motivated the experts to steer clear of addressing weapons of mass destruction through the ICRC-convened process.²⁹⁴ Proposals at 1972 and 1973 conferences included no reference to regulation of weapons of mass destruction—or any other specific weapons for that matter—although select States attempted, unsuccessfully, to resurrect weapons regulation during the process.²⁹⁵ States similarly rejected consideration of chemical weapons and other non-conventional weapons in the UN-sponsored CCW process; however, a separate negotiation was soon underway.

290. JOENNIEMI & ROSAS, *supra* note 36, at 33. *See also* Baudendistel, *supra* note 280, at 83–85, 99 (noting an Italian admission of gas use); Parks, *Chemical-Biological Warfare*, *supra* note 276, at 1166 (alleging use of chemical weapons by the Soviet Union during its 1980 invasion of Afghanistan) (citing Legal Adviser, U.S. Department of State, Memorandum of Law: Reported Use of Chemical Agents in Afghanistan, Laos, and Kampuchea 6–7 (Apr. 9, 1980)).

291. Baudendistel, *supra* note 280, at 102 n.34.

292. Cole, *supra* note 84, at 119.

293. INTERNATIONAL COMMITTEE OF THE RED CROSS, CONFERENCE OF GOVERNMENT EXPERTS ON THE REAFFIRMATION AND DEVELOPMENT OF INTERNATIONAL HUMANITARIAN LAW APPLICABLE IN ARMED CONFLICTS, GENEVA, 24 MAY–12 JUNE 1971: REPORT ON THE WORK OF THE CONFERENCE ¶¶ 476–77 (1971) [hereinafter 1971 REPORT OF GOVERNMENT EXPERTS].

294. *Id.* ¶ 477.

295. Egypt, Finland, Mexico, Sweden, Switzerland and Yugoslavia argued most persistently to include weapons regulations in the work of the conferences. *See* 2 INTERNATIONAL COMMITTEE OF THE RED CROSS, CONFERENCE OF GOVERNMENT EXPERTS ON THE REAFFIRMATION AND DEVELOPMENT OF INTERNATIONAL HUMANITARIAN LAW APPLICABLE IN ARMED CONFLICTS, SECOND SESSION, GENEVA, 3 MAY–3 JUNE 1972: REPORT ON THE WORK OF THE CONFERENCE 57 (1972). The proposal would have prohibited entirely delayed-action weapons, incendiary weapons and small caliber fragmentation bombs. *Id.* The proposal drew the support of experts from Algeria, Austria, Kuwait, Libya, Mali, Saudi Arabia and Syria. *Id.*

With the Iran-Iraq conflict firmly in mind, States convened the 1989 Paris Conference to strengthen and update the chemical weapons ban.²⁹⁶ The Final Declaration of the conference indicated States' eager desire to conclude a new convention to address chemical weapons.²⁹⁷ Meanwhile, a thawing of Cold War tensions between the United States and the Soviet Union made feasible the verification measures that many States had demanded precede regulation of chemical weapons beyond the first use prohibited by the 1925 Gas Protocol. The Paris Conference produced international legislative momentum that culminated in the 1993 Convention on Chemical Weapons (CWC).²⁹⁸ Reports indicate that although its development was prolonged, the CWC was concluded with relative ease.²⁹⁹

The CWC added a number of significant improvements over its predecessor. First, it reiterated the customary and 1925 Protocol bans on use of chemical weapons, although without the State reciprocity reservations that had accompanied the latter's ban.³⁰⁰ Second, the CWC added provisions that forbid State parties to "develop, produce, otherwise acquire, stockpile or retain chemical weapons, or transfer, directly or indirectly, chemical weapons to anyone."³⁰¹ Third, it prohibits State parties to "assist, encourage, or induce, in any way, anyone to engage in any activity prohibited to a State Party."³⁰² Lastly, the CWC obliged State parties to destroy their existing arsenals of chemical weapons and production facilities³⁰³ and included an elaborate regime of verification inspections.³⁰⁴

Not long after the CWC took shape, States reiterated their support for the chemical weapons ban in the ICC Statute, which includes violation of the ban among war crimes subject to the Court's jurisdiction.³⁰⁵ And recently, reports of Syrian chemical weapons use against insurgents in the

296. See Conference of States Parties to the 1925 Geneva Protocol and Other Interested States on the Prohibition of Chemical Weapons, *Final Declaration* (Jan. 11, 1989), reprinted in 28 INTERNATIONAL LEGAL MATERIALS 1020 (1989). See also Pierre Morel, *The Paris Conference on the Prohibition of Chemical Weapons*, 12 DISARMAMENT 127 (1989).

297. Final Declaration, *supra* note 296, Annex, ¶ 3.

298. Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, Jan. 13, 1993, 1974 U.N.T.S. 45 [hereinafter 1993 CWC].

299. GILLESPIE, *supra* note 76, at 96.

300. 1993 CWC, *supra* note 298, art. I (1)(b).

301. *Id.*, art. I (1)(a).

302. *Id.*, art. I (1)(d).

303. *Id.*, arts. I (2)–(4), IV, V.

304. *Id.*

305. ICC Rome Statute, *supra* note 27, art. 8(2)(b)(xviii).

current civil war have appeared in numerous media. Although Syria was not a State party to the CWC at the time, international concern and objections to Syrian chemical weapons stocks proved sufficiently grave to inspire the UN Security Council to take action, the historic Syrian-Russian alliance notwithstanding.³⁰⁶

Despite their infrequent use and extensive production and deployment, chemical weapons appear capable of mustering consistent international condemnation—legal and political—rivalled only by poison and perhaps biological weapons.

M. Biological and Bacteriological Weapons

Long before humans developed sophisticated understandings of bacteria, viruses and toxins, armies appreciated the potential of incorporating biological agents and pathogens into their arsenals. Ancient practices of warfare included driving diseased animals into enemy lines, lacing weapons with feces and rotted organisms' remains, and introducing plague and other diseases into enemy forces and populations.³⁰⁷ Even without deliberate human assistance, disease has long been a conspicuous feature of warfare. It is frequently thought that casualties of nature's agents—cholera, typhus, tuberculosis, plague, malaria, influenza and the like—have outpaced those of manmade weapons in many conflicts.³⁰⁸

A number of factors, including their affordability, ease of manufacture and ability to self-multiply, have made biological weapons especially worrisome and therefore targets of regulation.³⁰⁹ Extraordinarily small doses of pathogens can result in infection.³¹⁰ Once infected, a host can transmit communicable diseases to new hosts by any number of pathways.³¹¹ Advances in aerosol delivery added drastically to the dangers of biological weapons. Aerosol forms greatly decreased the amounts of pathogens needed, significantly facilitated chances of infection and notably increased le-

306. S.C. Res. 2209, ¶¶ 1–3, U.N. Doc. S/RES/2209 (Mar. 6, 2015).

307. GILLESPIE, *supra* note 76, at 102–3.

308. *Id.* at 104. Gillespie reports that disease killed more combatants than did bullets during both the Franco-Prussian and Spanish-American Wars. *Id.* During 1918, 60 percent of deaths of U.S. troops were by influenza. *Id.*

309. GILLESPIE, *supra* note 76, at 100, 102.

310. GREGORY D. KOBLENTZ, *LIVING WEAPONS: BIOLOGICAL WARFARE AND INTERNATIONAL SECURITY* 9 (2009).

311. *Id.*

thality.³¹² Biological weapons also offer significant advantages to attackers given the diversity of agents, their potency, the ease of achieving surprise and the extreme difficulty of mounting an effective defense.³¹³

Although they saw no documented use in the First World War, bacteriological weapons received special attention from the League of Nations in disarmament proceedings following the war. Like poisons, biological weapons frustrate and erode centuries of human effort to acquire medical knowledge and techniques for survival. The prospect of uncontrolled epidemic and blowback against an attacker further fuels human revulsion of these weapons. They are not only by nature indiscriminate between combatant and civilian, but also between enemy and friend. A committee assigned to study special weapons concluded “bacteriological warfare ought to be included in qualitative disarmament It is so particularly odious that it revolts the conscience of humanity more than any other method of warfare.”³¹⁴ These views were reflected in the 1925 Geneva Gas Protocol, which had banned not only chemical weapons use, but also “the use of bacteriological methods of warfare.”³¹⁵

Enthusiasm for regulating bacteriological methods notwithstanding, the Protocol’s ban proved inadequate in three important respects. First, it made no effort to define the scope of its prohibition. No definition or technical annex accompanies the Protocol. Second, as with its treatment of chemical weapons, it did not prohibit development, production or stockpiling of biological weapons. Finally, the bacteriological ban fell prey to extensive reservations with respect to reciprocity filed by many State parties.³¹⁶

By the 1970s, these shortcomings, evidenced by the horrific use of biological weapons by Japan during the Second World War³¹⁷ and frightening developments in States’ capacity to produce and disseminate biological

312. *Id.* at 15.

313. *Id.* at 22.

314. Kalshoven, *Arms*, *supra* note 8, at 221 (quoting League of Nations, Conf. D.120, ¶ 11 (May 31, 1932)).

315. 1925 Geneva Protocol, *supra* note 283, para. 4.

316. Reservations, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 116–23.

317. *See* GILLESPIE, *supra* note 76, at 107–8 (citing DANIEL BARENBLATT, A PLAGUE UPON HUMANITY (2004); SHELDON H. HARRIS, FACTORIES OF DEATH: JAPANESE BIOLOGICAL WARFARE: 1932–45 (1995)). Gillespie reports conservative estimates of as many as 500,000 Chinese biological weapon casualties. GILLESPIE, *supra*, at 107.

agents,³¹⁸ provoked sufficient concern to update the law. By 1972, States concluded the Convention on the Prohibition of Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction.³¹⁹ In addition to reinforcing the 1925 Protocol's ban on use, the 1972 Convention effectively rendered biological weapons international contraband, except for narrow purposes related to research. Although it, curiously, does not address use of biological weapons directly, the Convention's prohibitions on their development, stockpiling and production render use practically impossible.³²⁰ Moreover, State parties to the Convention confirmed at their Fourth Review Conference an understanding that use was prohibited.³²¹

Air Commodore Boothby assesses the Biological Convention as “arguably, the first treaty to have prohibited entirely a category of weapon.”³²² Currently, there are 171 State parties to the Biological Convention.³²³ Since the Convention's entry into force, scheduled review conferences have focused on developing binding verification measures acceptable to States.³²⁴ Greatly complicating efforts to verify compliance with the Convention and undermining its effectiveness at eliminating biological weapons is the “multiuse dilemma.” Koblenz notes “the skills, materials, and technology needed to produce biological weapons are also necessary to develop defenses against them and to conduct civilian activities such as biomedical research and pharmaceutical production.”³²⁵ Multiuse, combined with their nearly

318. GILLESPIE, *supra* note 76, at 107 (reporting that during the Cold War most military powers developed extensive biological weapons arsenals).

319. Convention on the Prohibition of Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Apr. 10, 1972, 26 U.S.T. 583, 1015 U.N.T.S. 163 [hereinafter 1972 Biological Convention].

320. *See id.*, art. I.

321. *See* Fourth Review Conference of the Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Geneva, 25 November–6 December 1996, *Final Document*, at 14, Doc. BWC/CONF.IV/9 (1996), available at http://www.opbw.org/rev_cons/4rc/docs/rev_con_docs/i_docs/IV-09.pdf.

322. BOOTHBY, *supra* note 103, at 126. *See also* KOBLENTZ, *supra* note 310, at 4–5.

323. *Treaties Database, Status of the Treaty*, UNODA, <http://disarmament.un.org/treaties/t/bwc> (last visited July 29, 2015).

324. *See, e.g.*, Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Report of the Meeting of States Parties, Doc. BWC/MSP/2014/5 (Dec. 15, 2014).

325. KOBLENTZ, *supra* note 310, at 5.

unrivaled capacity to inflict mass casualties through self-propagation and spread, makes biological weapons at once a tempting and problematic weapon despite apparently manifest State zeal for their prohibition.

N. Nuclear Weapons

Since their advent, nuclear weapons have been the object of persistent efforts with respect to both arms control and specific law of war regulation or prohibition. As with other weapons of mass destruction, however, States have regularly excluded nuclear weapons from consideration in general development of the law of war applicable to weapons. Yet unlike chemical and biological weapons, nuclear weapons are subject to no form of independent law of war regulation. In fact, they may be regarded by some States to exist outside the realm of conventional law of war regulation altogether.

State exceptionalism with respect to nuclear weapons and law of war development dates to the immediate aftermath of their use at the end of the Second World War. After brief flashes of almost utopian interest in international stewardship of nuclear materials, nuclear States swiftly adopted stances against law of war regulation of nuclear weapons. States rejected early proposals to incorporate regulation of nuclear weapons into either the 1925 Geneva Protocol regime or the 1949 Geneva Conventions.³²⁶ The expert meetings and diplomatic conference that produced the 1977 Additional Protocols saw several proposals to address nuclear weapons; however, each attempt met again with insistence that nuclear weapons were not a topic for discussion at these conferences.³²⁷ Not content to let these *travaux préparatoires* or even the agreed upon Protocols speak for themselves, a number of States reiterated their objections to including nuclear weapons in the ambit of the Protocols' rules with nuclear weapon exclusionary statements on signature and accession. French and UK statements are representative providing, respectively:

Referring to the draft protocol drawn up by the International Committee of the Red Cross which constituted the basis of 1974–1977 Diplomatic Conference, the Government of the French Republic continues to consider that the Protocol's provisions concern exclusively conventional

326. Kalshoven, *Arms*, *supra* note 8, at 271–73.

327. 1971 REPORT OF GOVERNMENT EXPERTS, *supra* note 293, ¶ 477.

weapons and do not regulate or prohibit the use of nuclear weapons³²⁸

It continues to be the understanding of the United Kingdom that the rules introduced by the Protocol apply exclusively to conventional weapons without prejudice to any other rules of international law applicable to other types of weapons. In particular, the rules so introduced do not have any effect on and do not regulate or prohibit the use of nuclear weapons.³²⁹

Nuclear legal exceptionalism was not the exclusive view of nuclear powers nor AP I parties. Non-nuclear States, especially NATO members benefitting from the deterrence postures of allied nuclear powers affirmed the view that the Protocols had no application to nuclear weapons as well.³³⁰ And although not a party to the Protocols, the United States submitted an understanding at the time of its signature stating, “the rules established by this protocol were not intended to have any effect on and do not regulate or prohibit the use of nuclear weapons.”³³¹ Attempts to incorporate nuclear weapons regulation into the UN-sponsored weapons regulation processes met resistance from States as well. Indeed the very title of the proceedings and resulting treaty confirm as much with their prominent reference to “Certain *Conventional Weapons*.”

Even by the mid-1990s, amid thawing of Cold War postures, it seems nuclear powers’ resolve to except nuclear weapons from regulation remained largely unabated. In 1993, the World Health Organization prompted an advisory opinion from the International Court of Justice (ICJ) con-

328. France, Reservations and Declarations Made on Accession to Protocol I, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 800.

329. United Kingdom of Great Britain and Northern Ireland, Reservations and Declarations made on Ratification, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 815.

330. Belgium, Declaration of Interpretation Made on Ratification, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 795; Canada, Reservations and Declarations Made at the Time of Ratification, Statements of Understanding (Conventional Weapons), *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra*, at 797; Germany, Declarations Made at the Time of Ratification, ¶ 1, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra*, at 802; Italy, Declarations Made on Ratification, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra*, at 807; Netherlands, Declarations Made on Ratification, ¶ 1, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra*, at 810; Spain, Interpretive Declarations Made at the Time of Ratification, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra*, at 813.

331. United States, Declaration Made on Signature, ¶ 1, *reprinted in* THE LAWS OF ARMED CONFLICTS, *supra* note 13, at 810.

cerning the legality of nuclear weapons under international law.³³² The Court devoted specific attention to the status of nuclear weapons under the law of war. Nuclear powers reiterated positions held throughout the weapons conferences of the 1970s and 1980s. The United States submitted a representative statement in response to the litigation that provided, “It is apparent that none of [the Protocol I] prohibitions was negotiated with nuclear weapons in mind and would not have been adopted had they been thought to be applicable to nuclear weapons.”³³³

Though firm in their rejection of the application of the “new” and finely-tuned rules of Additional Protocol I to nuclear weapons, States did not characterize use of nuclear weapons as entirely extra-legal. Even the United States admitted that, at minimum, the principles of discrimination and unnecessary suffering operated with respect to nuclear weapons.³³⁴ The ICJ concluded similarly, confirming the cardinal principles of discrimination and unnecessary suffering and advised that nuclear weapons use would generally violate the law of war.³³⁵ However, the Court ultimately advised that it “cannot reach a definitive conclusion as to the legality or illegality” of nuclear weapons *per se*.³³⁶ The advisory opinion, combined with States’ views on non-application of the Additional Protocol I refinements to targeting law, have left regulation of nuclear weapons largely to the uncertainties and ambiguities of law of war custom and principles. Ultimately, nuclear weapons have proved remarkably regulation resistant. Not even the prospect of human annihilation has proved sufficient to overcome nuclear States’ confirmed belief that these widely deployed weapons, offering unique military advantage, should remain free from any specific law of war restraints.

332. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226 (July 8).

333. Written Statement of the Government of the United States of America 28 (June 10, 1994), Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996, available at <http://www.icj-cij.org/docket/files/93/8770.pdf>.

334. *Id.* at 26–29.

335. Nuclear Weapons Advisory Opinion, 1996 I.C.J., ¶¶ 78, 85, 97.

336. *Id.* ¶ 97.

IV. IDENTIFYING REGULATION TOLERANCE AND REGULATION RESISTANCE

As the preceding surveys of law of war principles and specific regulations have illustrated, States and private actors that seek to establish law of war limits on weapons face significant uncertainties. Even with widely acknowledged principles to guide the regulation of weapons, weapons law proponents face a difficult task securing sufficient agreement on the precise content and meaning of these principles to achieve meaningful and effective limitations on weapons. And despite a noteworthy catalog of specific treaties to regulate and even ban certain weapons, the challenge of convincing the vastly heterogeneous community of States, and especially that of militarily significant States, to go along often prevents even the most logical and attractive humanitarian limitations from succeeding. Meanwhile, in many cases the immense investments of political, diplomatic and financial capital required greatly reduce opportunities for progress. Therefore, assessing the prospects of success in advance of any campaign to advance weapons law is a matter of equal difficulty and importance.

The three principles of unnecessary suffering, discrimination and honor certainly remain the primary indicators for predicting regulatory success. States have obviously coalesced around views that some weapons violate these law of war principles *per se*. For example, non-detectable fragments presented a sufficiently compelling case with respect to unnecessary suffering to achieve consensus among CCW parties. Early in the twentieth century, States quickly agreed that biological weapons could not be used consistent with the principle of discrimination. And poison seems clearly to have run afoul of most States' senses of the honor and good faith required by the principle prohibiting treacherous means that has existed for the majority of recorded history.

Yet clearly, forces and considerations beyond these law of war principles have played important parts in successful and failed efforts to regulate weapons through the law of war. The historical record recounted above suggests that further factors—factors associated with the weapons themselves—have also influenced States' receptivity to or rejection of law of war regulation. This Part identifies these factors, associates them with historical weapons law efforts and correlates each, to the extent possible, with regulation tolerance or resistance in future weapons law efforts. Specifically, the traits of effectiveness, novelty, deployment, medical compatibility, disruptiveness and notoriety will be identified with various historical efforts to

regulate weapons and characterized with respect to regulation tolerance or resistance.

A. Effectiveness

The most important factor in evaluating States' willingness to regulate a weapon may be that of effectiveness. Efficacy in terms of permitting a belligerent to impose its will on an enemy is, after all, the *raison d'être* of weapons. Accordingly, the historical record shows that States have rarely been willing to forfeit the service of a truly effective weapon in the name of humanity. Bans on weapons such as non-detectable fragments and chemical and biological weapons may be just as much reflections of relative ineffectiveness as these weapons' propensity to inflict unnecessary suffering. To better understand effectiveness and to account for historical examples as accurately as possible, two notions of effectiveness can be identified. Effectiveness with respect to access and effectiveness with respect to securing dominance or victory prove separate and useful indicators not only of battlefield outcomes, but also of regulatory results.

Access constitutes a critical facet of weapon capabilities. Weapons that give unprecedented access have not only achieved remarkable tactical success, but have also proved capable of tipping the operational and strategic balance of armed conflict. In particular, weapons capable of providing access to previously inaccessible enemy forces and vulnerabilities have proved, at least until adequate defenses are devised and fielded, some of the most influential and effective weapons in history.

Although true primarily at exceptionally low tactical levels, incendiaries greatly expanded attackers' access to entrenched and fortified defenders in ways that few other weapons could rival or mimic. When employed against flammable defensive materials, incendiaries can extend an attacker's reach far beyond the point of initial contact. When projected by pressurized means, flammable liquids are capable of reaching enemy forces in confined areas and reaching even further when they ignite materials that surround defenders. Although chemical gases and biological aerosols have also proved capable of permeating complex defenses, their residual effects, expense, delay in achieving effects and, most importantly, their potential for blowback on friendly forces make them far inferior to portable incendiaries. Thus, despite intense campaigns to outlaw their use and compelling concern for the intense suffering they inflict on victims, incendiaries have proved remarkably resistant to regulation due in no small part to their abil-

ity to give effective access to enemy vulnerabilities. While CCW Protocol III managed to limit their use in areas of civilian concentration, incendiaries remain an entirely lawful weapon against military objectives and enemy combatants because, in large part, they provide nearly inimitable access and effective ability to achieve the desired effects.

Effectiveness in terms of access to enemy vulnerabilities has proved an important consideration for more than weapons. By providing access required for effective attacks, delivery platforms such as missiles, aircraft, vessels and vehicles have played a crucial role in the history of warfare. Consistent with reluctance to regulate weapons that provide effective access to enemy forces, States have proved especially reluctant to accept regulations on means of delivery that provide improved battlefield access. Although the First Hague Peace conference included a declaration banning use of balloons to deliver projectiles and explosives,³³⁷ that instrument proved to be exceptionally short-lived and ineffective. Drafted to expire after five years, the 1899 Hague Declaration IV was renewed in 1907,³³⁸ however, several parties to the 1899 Declaration did not ratify the 1907 Declaration, including France, Germany, Japan and Russia. And while technically still in force, the 1907 Declaration proved unable to restrict aerial bombardment in any significant manner in subsequent conflicts. Regulation of aerial bombardment moved away from restraints on aircraft per se and toward regulation of how and against which targets they could lawfully be used. The tactically and strategically critical access that new means of delivery made available throughout the twentieth century rendered them in nearly all cases exceptionally regulation resistant. Throughout the twentieth century, States consistently rejected attempts to develop limits on aircraft, submarines and other means of delivering weapons. Given the value States attach to effectiveness in terms of access to enemy vulnerabilities, emerging means of weapon delivery, especially those that increase access, seem likely to prove similarly regulation resistant.

337. Declaration (IV, 1) to Prohibit for the Term of Five Years, the Launching of Projectiles and Explosives from Balloons, and other Methods of Similar a Nature, July 29, 1899, 32 Stat. 1839, 26 Martens Nouveau Recueil (ser. 2) 994, 1 Bevens 270, *reprinted in* DOCUMENTS ON THE LAWS OF WAR, *supra* note 74, at 309. *See also* Eric Talbot Jensen, *Emerging Technologies and LOAC Signaling*, 91 INTERNATIONAL LAW STUDIES 621, 627–28 (2015) (recounting and analyzing the history and performance of the 1899 Balloons Declaration).

338. Declaration (XIV) Prohibiting the Discharge of Projectiles and Explosives from Balloons, Oct. 18, 1907, 3 Martens Nouveau Recueil (ser. 3). 745, 36 Stat. 2439, 205 Consol. T.S. 403, *reprinted in* DOCUMENTS ON THE LAWS OF WAR, *supra* note 76, at 309.

Effectiveness can be also accounted for through a weapon's capacity to achieve dominance or even win wars. Some weapons have simply proved to be game changers, tipping the tactical, operational and even strategic balance in favor of those who wield them. Nuclear weapons surely represent the best example of weapons capable of imposing a decisive defeat on even a determined and capable enemy. The United States' use of atomic bombs against Japan was an unprecedented example of how a single weapon can decisively alter, or at least greatly shorten, the course of an armed conflict.

To be sure, war-winning effectiveness has often come at great cost in terms of humanity. The Hiroshima and Nagasaki bombings, while militarily decisive, came at the cost of immense civilian casualties. Moral complexities and even legal dilemmas provoked by their use persist decades later. And the war-winning capacity of nuclear weapons in the present international security environment has been highly debatable for some time.³³⁹ Whether the strategic effects achieved by the Hiroshima and Nagasaki bombings could be replicated by nuclear weapons in a world that pits nuclear powers against one another developed into an entire field of study. Regardless, nuclear States remain committed to the effectiveness of nuclear weapons, either as war-winning weapons or as the only effective deterrents to enemies who might seek to use them. Meanwhile, non-nuclear States are expending enormous financial resources and political and human capital to develop them. The perceived war-winning effectiveness of nuclear weapons, or the capacity to counter such use, surely explains a great deal about States persistent rejection of law of war regulation of these terrifying weapons. Despite their shocking, near unjustifiable consequences, nuclear weapons remain regulated by nothing more than the most general and abstract principles of the law of war. Although unimaginable at present, it is likely that any new weapon with comparable war-winning capacity would prove equally resistant to law of war regulation.

Conversely, weapons that are minimally or questionably effective have proved in many cases to be quite susceptible to law of war regulation. Although widely deployed, chemical and biological weapons never appeared

339. See Theodore Richard, Nuclear Targeting and Military Objectives 33 (unpublished manuscript) (on file with author) (citing Presidential Directive 59/NSC-59 (July 25, 1980), available at <http://www.jimmycarterlibrary.gov/documents/pddirectives/pd59.pdf>. Presidential Directive 59 ordered U.S. nuclear strategists to devise a plan of deterrence to make clear to the Soviet Union that nuclear attacks would not produce "any plausible definition of victory." *Id.* at 1).

to offer sufficient military advantage to be considered effective. Their chief military value appears to be their capacity to terrorize or, in the case of prepared defenders, to harass or momentarily hinder operations. Experience with the use of chemical weapons in the First World War did not reveal them to offer a war-winning contribution and States quickly agreed to a significant though qualified ban on their use, followed later by a comprehensive ban. It is likely that weapons that can be proved to offer similarly nominal military advantage will prove similarly susceptible to regulation. Present campaigns to regulate weapons seem already to have integrated this lesson into their efforts, offering detailed studies and data with respect to military effectiveness, especially lack thereof.³⁴⁰

B. Novelty

Most developments in weapons have been evolutionary in nature. “New” weapons have often proved simply to be improvements on existing designs, offering little change in the nature or true character of their predecessors. The very earliest stages of either development or deployment of new weapons present a mixed experience. On one hand, States have proved surprisingly willing to accept restraints on newly emerging technologies. Early twentieth century experience with aerial bombardment, biological weapons and chemical weapons indicate a surprising willingness to regulate new military technology. On the other hand, States proved resistant to early efforts to regulate nuclear weapons, as well as blinding lasers and submarines. The regulations developed with respect to the latter two either required sustained and prolonged effort, or produced highly ineffective limitations. At present, a “wait and see” approach seems to prevail with respect to prospective or early regulation of novel military technology. Understanding the impact of novelty and innovation on regulatory acceptance or rejection may require a deeper understanding of military attitudes and culture.

O’Connell identifies military attitudes towards weapons as critical determinants of approval. In particular he notes that weapon ancestry predicts acceptance and suppression.³⁴¹ Unsurprisingly, weapons that represent evolutions of established families of armaments with identifiable heritages, so-called “familiar compartments”—the missile to the catapult shot; the

340. See, e.g., FATALLY FLAWED, *supra* note 242 (noting the reduced military impact of cluster bombs in light of high dud rates); ICRC, FRIEND OR FOE, *supra* note 189, at 40–46.

341. O’CONNELL, *supra* note 108, at 7.

armored formation to the phalanx; the naval cruiser to the trireme—enjoy ready acceptance.³⁴² By contrast, new weapons lacking traceable ancestry find themselves prone to suppression.³⁴³ Initial reactions to projectile weapons, to submarines, to chemical weapons and to aerial warfare are historically representative.

Delving somewhat deeper into military acceptance and rejection of weapons, O’Connell notes the military profession’s preferences for decorum and predictability.³⁴⁴ He observes,

The urge to bring weapons under a specific body of rules and regulations would seem to have more than just a pragmatic basis. The ritualization of combat, as opposed to the more laissez-faire approach exemplified in predatory behavior, has always provided a major theme in weapons development, and one that cannot be attributed wholly to humanistic motives. Rather, it follows that the inclination to fight by the rules, to use similar weapons in a prescribed fashion, is a vestige of intraspecific combat.”³⁴⁵

Although presently in decline, military professionals’ role in law of war formation has historically been significant. Military commanders and staff officers were frequent participants in late nineteenth and early twentieth century diplomatic conferences that produced law of war instruments. The records of committee meetings and plenary sessions alike feature their perspectives and indicate a high degree of deference toward their views, especially with respect to weapons regulations. So long as States accommodate military participation in weapons law conferences and diplomatic conventions, novelty, and by implication military reactions to novel weapons, will prove important indicators of regulation tolerance and resistance.

C. Deployment

Not far removed from novelty, but nonetheless sufficiently distinct to merit separate consideration, is deployment. In this context, deployment refers to the extent to which a weapon has been acquired, fielded and integrated into States’ military operations. Weapons that have not yet been deployed

342. *Id.* at 6.

343. *Id.* at 7.

344. *Id.* at 8.

345. *Id.* at 24.

by States have proved somewhat tolerant of efforts at regulation or prohibition. Not surprisingly, widely deployed systems have proved, at least for long periods, to be prohibition resistant, but by no means prohibition proof. The record of widely deployed weapons with respect to regulation, rather than prohibition, has been somewhat more promising; States have proven occasionally willing to accept regulations on the use of widely deployed weapons, but not to their ban.

The notion that States might prove willing to regulate weapons that are not yet widely deployed, and therefore not widely combat tested, is supported by significant experience. At the time of the 1899 Hague Gas Declaration, chemical weapons were not widely deployed among the major powers' armed forces, nor had they yet seen significant battlefield use. At the time the 1925 Geneva Gas Protocol addressed biological weapons, few States were thought to have fielded those weapons in operationally significant numbers.

More recently, Protocol IV to the CCW banned use of lasers designed to inflict blindness before any State had deployed or employed any such weapon in combat, a phenomenon often remarked on by weapons law commentators.³⁴⁶ Accounts of the effort to ban blinding lasers showcase reports that the U.S. Army had at least ten laser weapon systems in development at the time of the UN conference that produced Protocol IV.³⁴⁷ Most major military powers were believed to have laser weapon programs at the time as well.³⁴⁸ However, these systems seem to have been developed primarily to frustrate or incapacitate optical detection systems, and not as anti-personnel blinding systems.³⁴⁹

For States and other actors interested in regulating widely deployed weapons, experience with regulating anti-personnel landmines and cluster munitions counsels patience and persistence. Both landmines and cluster munitions saw widespread deployment—the former in great numbers among a great number of armies, the latter, owing to technical sophistication and expense, in great numbers among significantly fewer, but still very large militaries. Campaigns to prohibit both weapons originated in the late

346. See, e.g., BOOTHBY, *supra* note 103, at 209 (citing Robert J. Mathews, *The 1980 Convention on Certain Conventional Weapons: A Useful Framework Despite Earlier Disappointments*, 83 INTERNATIONAL REVIEW OF THE RED CROSS 991(2001)).

347. HUMAN RIGHTS WATCH, U.S. BLINDING LASER WEAPONS (1995), available at <http://www.hrw.org/reports/1995/Us2.htm>.

348. *Id.*

349. *Id.*

1960s and early 1970s push to address weapons generally. Neither effort saw any immediate success, yet each ultimately produced both widely accepted regulations and increasingly ratified prohibitions. Experience with the two conventions prohibiting landmines and cluster munitions are particularly instructive as neither has yet achieved its ultimate goal of eradication. States that have invested most heavily in both landmines and cluster munitions, the United States, Russia and China in particular, have proved especially resistant to prohibitions, even in the face of growing stigma.

Whether States' failure to deploy weapons actually results in regulation or prohibition tolerance is undoubtedly tenuous. States are unlikely to develop, acquire or deploy weapons that obviously run afoul of law of war principles. However, weapons widely deployed by States, such as landmines and cluster munitions, have been regulated and in some cases prohibited later after significant deployments. In this sense, deployment can account for shifting senses of humanity, public opinion or even what constitutes unnecessary suffering or discrimination.

D. Medical Compatibility

Weapons that produce wounds compatible with existing medical protocols and capable of treatment by means available in military and field hospitals have in many cases also proved resistant to regulation. For example, weapons, such as small arms projectiles, fragmentation devices and flechettes that produce simple trauma have proved highly resistant to regulation. Military medical units and humanitarian organizations' field hospitals are experienced at treating, and are usually equipped to treat, trauma wounds. Although innovations in physical trauma-producing weapons have repeatedly provoked efforts at regulation, few weapons, with the possible exceptions of landmines and cluster munitions, involving nothing more than increased physical trauma treatable by prevailing standards of medical care have yielded to meaningful regulation.

By contrast, weapons that produce wounds incompatible with—or that frustrate or vex—prevailing protocols of medical care provided to war victims seem more tolerant or susceptible to regulation. Deliberate attempts to devise means of inflicting wounds that evade or dangerously complicate medical treatment seem highly likely to meet little resistance to regulation from States.

Non-detectable fragments are a prime example of technology likely to produce wounds incompatible with established medical capability and pro-

protocols. Medical imaging used in military and humanitarian medical facilities relies heavily on x-ray detection of metal fragments to treat battlefield trauma. The tendency of undetectable fragments to evade this treatment protocol and to require unconventional exploratory surgery surely informs States receptivity to their prohibition. Similarly, barbed piercing weapons have long been prohibited, not merely for the increased suffering associated with their removal, but also for their incompatibility with standard medical treatment protocols.

Admittedly, the characteristic of medical compatibility is not entirely distinct from the well-recognized law of war principle of unnecessary suffering. That principle has long considered wound severity and treatment prospects in its balancing calculus. It is also true that as a criterion for evaluating weapons, medical compatibility evokes memory of the failed SIRUS Project's medical standards for evaluating unnecessary suffering. However, recognition of medical compatibility, while not itself a legal criterion, does offer a helpful refinement of the principle of unnecessary suffering. Moreover, based on historical practice, medical compatibility seems to offer impressive predictive value. On initial examination, weapons producing medically challenging or novel wounds have proved marginally more tolerant of regulation than those producing routinely treatable injury.

E. Disruptiveness

Concerns for the socially and militarily disruptive effects of weapons seem to have motivated as many campaigns for law of war regulation as have concerns for inhumane effects. States owing their power or momentary hegemony to investments in existing military technologies have quite naturally sought to limit, by a range of means, including international law, other States' access to technology and weapons capable of disrupting that hegemony or displacing them from preeminence. Historical examples abound of attempts to use law to achieve, sustain or artificially prolong military technical advantages that could not be otherwise maintained in armories or on the battlefield. Few, if any, of these efforts have proved successful. Disruptive weapons have nearly always managed to find their way to the battlefield. Potential for social or military disruptiveness, therefore, seems an especially strong indicator of regulation resistance.

Possibly the earliest—and certainly the best known and most recounted—effort to regulate a militarily disruptive weapon is the Lateran Council's ban on the crossbow. Although the Council's edict invoked religion

and concern for humanity, the ban is better explained as an effort to secure the battlefield preeminence of mounted nobility. The ban never proved effective. In subsequent centuries the crossbow inflicted not only enormously effective casualties, but also resulted in much of the social and military disruption that had concerned the Council. Although the crossbow ban predated the present State-centric international legal order, the feudal societies and orders that preceded States clearly rejected law of war regulation of this highly disruptive weapon.

Later efforts, similarly motivated to preempt or preclude disruptive weapons, met fates much like that of the crossbow ban. After firearms threatened the place of armored nobility—and later archers and other machine-powered weapons—efforts to ban them failed repeatedly. Submarines proved a highly disruptive threat to the naval supremacy and empire of Great Britain, yet multiple efforts to ban them during the twentieth century failed. And nuclear weapons, perhaps the most disruptive of all weapons with their capacity to marginalize nearly any conventional weapon system, provoked stark exceptionalism from States—perhaps the strongest regulation resistance yet demonstrated.

The ban on poison presents an interesting study in disruption and law of war regulation. In addition to their capacity to instill fear in opposing forces and inflict atrocious suffering, poisons proved especially effective at disrupting social order. An important tool in assassinations, especially of high-level military and political leaders, poisons would seem by the theory offered here to have provoked a high degree of regulation resistance. States' relative tolerance for poison regulation may require a caveat to the general experience of disruptive weapons' regulation resistance. In defense of disruption as an indicator of regulation resistance, however, poison's disruptive effects have tended to operate with respect to assassination rather than open combat. That is, while disruptive in a political sense, poison may not have proved to be especially disruptive in a military or military-technical sense. The ban on its use and States' relative restraint with respect to poisons may, after all, prove less detrimental to the theory of weapon disruptiveness.

F. Notoriety

Even in liberal democracies, decisions about weapon development, procurement and deployment are not usually made in public. Voters rarely weigh in directly on the composition of their countries' arsenals. Still, pub-

lic opinion and public conscience have proved influential inputs in past efforts to revise weapons law. In the still blossoming Information Age, public perceptions of weapons and their effects are likely to be increasingly influential forces in international regulation of weapons.

Historical experience reveals that some weapons have generated a greater degree of public notoriety than others. In some cases, as perhaps with poisons, public disapproval seems to have been sprung from innate human reactions. In other cases, such as anti-personnel landmines and cluster munitions, public notoriety and disapproval seems to have been spawned and cultivated by highly engineered, coordinated and impressively researched campaigns by civil society. As experience with landmines further indicates, even weapons with characteristics that typically indicate regulation resistance, such as high levels of deployment and effectiveness, can be made regulation tolerant through patient and persistent lobbying to raise their notoriety. Whether by genetic or social engineering, the public image and resulting opinion of weapons have proved to greatly affect, and even manipulate, weapons' regulation tolerance or resistance.

G. Equivocations

As is true of most theories, to fully capture the complexity and enormity of reality, the theory of regulation tolerance and regulation resistance offered by this article must include some equivocations and concede some exceptions. Examination of an historical record as long and as varied as that of weapons regulation prevents perfect coherence and consistency with any theory.

First, as previously noted, weapons' technical properties and characteristics are in no respect the exclusive determinates of whether States will tolerate or resist an effort to regulate them through the law of war. Political, military, cultural, historical and religious factors may even take precedence over factors related to the weapon itself. And in cases when these factors permit regulation, timing and even personalities may conspire either to facilitate or frustrate weapons law formation. It must then be clearly conceded that technical attributes and characteristics are but a few of many inputs that bear on whether a weapon proves regulation tolerant or resistant.

Furthermore, merely identifying technologies as either regulation resistant or tolerant may be too simplistic. It is possible that a weapon may be at once both resistant and tolerant of law of war regulation. That is, a

technology may be quite resistant to any effort to ban entirely its use or possession. Yet that same technology may simultaneously prove quite tolerant of efforts to develop limitations on its use through interpretation and application of existing principles, rules or precautions applicable to attacks. Poisons, again, present an interesting coincidence of characteristics. While capable of great social and military disruption and therefore historically indicated to resist regulation, poisons also elicit strong human revulsion, are often not compatible with medical treatment, and require deception and secrecy that prevent them being used conspicuously—all indicators of regulation tolerance.

Clearly then, some balancing is required in such cases. Strong showings with respect to regulation-tolerant characteristics might overcome contrasting, yet on aggregate weaker, indications of regulation-resistance. It is likely that the balance of these features, rather than any monolithic characterization, is responsible for a weapon's tolerance or resistance to law of war regulation. Even if this is correct, law of war legislators will surely find value in exploring further the occurrence of these and perhaps other qualities in weapons identified for potential law of war regulation.

Finally, there is an underappreciated two-way street between law and technology. While it is well understood that law influences the employment and operation of new technology, it is less appreciated that technology very often has a transformative effect on law. Confronted with new weapons technology, the international legal community, particularly non-governmental components, responds quickly to the question, "What can law do to limit or control this technology?" That community devotes far less attention to the question, "What does this technology do to existing law?"

V. CONCLUSION

Restraints on weapons may be a natural evolutionary phenomenon. Anthropological research suggests that early hominid extinctions may be attributable to an inability to control intra-species weapon use, rather than to predation or warfare with other hominid species.³⁵⁰ Thus, development of limitations on weapons and their use, expressed as cultural, ethical, legal or

350. O'CONNELL, *supra* note 108, at 24 (citing DOLF ZILLMAN, *HOSTILITY AND AGGRESSION* 99 (1980)).

other norms, may even be a fundamental tool of human survival and species preservation.

Notwithstanding its importance, predicting how States will adapt the law of war to weapons and military technological innovations has proved an exceptionally difficult and complex task. States have wavered between resort to principles and resort to specific rules with frustrating inconsistency. The prospects for genuine success at adapting the law to existing and emerging weapons are greatly dependent on an understanding of the inner workings of not only the technology of war, but also the processes, actors and influences that have historically formed the law of war applicable to weapons.

History and experience play extraordinarily useful roles in crafting theories to predict and evaluate new directions for weapons law. Indeed, a coherent and historically minded theory of law of war weapons regulation is essential to crafting strategies for future regulations. Part of a comprehensive understanding of weapons law development has been the operation and influence of underappreciated characteristics and attributes of weapons themselves. Although application and understanding of the traditional law of war principles explains a great deal of existing weapons law, the previously ignored attributes and criteria identified by this article may advance understanding and contribute to more effective efforts to advance weapons law. By charting both the history and methodology of weapons law with a view toward identifying forces and influences that have made some weapons susceptible to international regulation and made others resistant, this article offers a starting point for identifying sound investments of the very precious diplomatic, political and financial capital required to produce meaningful law of war developments.

Regulating weapons alone is by no means sufficient to strike a desirable legal balance between humanity and military necessity. As Professor Schmitt argued nearly a decade ago, detection platforms and fire control systems are as important to achieving humanity in war—if not more so—than the weapons they direct and guide.³⁵¹ Regulation of the training, attributes and conduct of the armed forces that employ weapons may be even more important facets of the international law of war. However, the rapid pace with which increasingly sophisticated means of warfare are developed and produced ensures a critical role for the regulation of weapons.

351. Michael N. Schmitt, *War, Technology and the Law of Armed Conflict*, in *THE LAW OF WAR IN THE 21ST CENTURY: WEAPONRY AND THE USE OF FORCE* 137, 142 (Anthony M. Helm ed., 2006) (Vol. 82, U.S. Naval War College International Law Studies).

Identifying characteristics and qualities of new technologies that history indicates as contributing to either regulation tolerance or resistance is surely a worthwhile endeavor.